

FRANCESCA SECCHI

University of Torino, Italy
Department of Agricultural, Forest and Food Science
(DISAFA)
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Secchi Francesca's research focuses on whole woody plant water relations, sugars metabolism, structure and function of plant vascular network and abiotic plant stress biology. Topics are studied using both physiological and molecular approaches. She is collaborating with international researchers: Prof. Maciej Zwieniecki (UC Davis, Davis, CA, USA), Prof. Noel Michele Holbrook (Harvard University, Cambridge, MA, USA), Dr. David Granot (Institute of Plant Sciences, Agricultural Research Organization, The Volcani Center, Israel), Prof. Matthew Gilbert (UC Davis, CA, USA) and Prof. Kevin Boyce (Department of Geological & Environmental Sciences, Stanford University).

POSITIONS

Researcher TD, University of Turin, Italy	2014-present
Assistant Project Scientist, University of California Davis	2012-2014
Post Doctorate, Arnold Arboretum of Harvard University	2009-2012
Mercer Postdoctoral Fellow, Arnold Arboretum of Harvard University	2007-2009

ACADEMIC QUALIFICATIONS

Ph.D. in Agricultural, Forestry and Food Science, University of Torino (Italy)	2007
Thesis: "Isolation and expression analysis of aquaporin genes in <i>Olea europaea</i> L."	
Supervisor: Prof .A. Schubert	
Master Degree in Plant Biotechnology. (2nd level Degree, University of Torino, Italy)	2003
Thesis: "Growth and persistence in Aosta Valley of highly virulent and genetically recognizable strains of the entomopathogenic fungus <i>Beauveria brongniartii</i> ".	
Supervisor: Prof .OI. Ozino	

FELLOWSHIP

Mercer Research Fellowship, Arnold Arboretum of Harvard University	2007
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INTERNSHIPS

Technical University Darmstadt	Darmstadt, Germany
Department of Botany and Applied Plant Science	Nov-Dec 2004
Visiting PhD Student	
Prof. Ralph Kaldenhoff	
University of the Balearic Islands	Palma, Spain
Department of Biology	July-Aug 2005
Visiting PhD Student	

Prof. Jaume Flexas

Agro-M/INRA

Department Biochimie et Physiologie Moléculaire des Plantes

Visiting PhD Student

Prof. Christophe Maurel

Montpellier, France

June-Sep 2006

PARTICIPATION in GRANTS

National Science Foundation Understanding xylem refilling: molecular and biophysical perspectives. PI Zwieniecki MA, (contributed to this grant, but by Harvard University standards postdocs cannot legally be listed as co-I). 2009-2013

Pistachio Grower Association Pistachio in dynamic environment– quantifying species resistance to abiotic stresses (freezing, salinity and drought) – step one freezing tolerance 2013

GRANTS (as Principal Investigator)

Programma Giovani Ricercatori “Rita Levi Montalcini” Understanding xylem refilling: molecular and physiological perspectives 2014

Elettra - Sincrotrone Trieste S.C.p.A Micro-CT assisted analysis of xylem recovery from water stress in plants subjected to physiological inhibition of cellular activity 2013

‘Excellent Young PI’ Unito - Compagnia San Paolo Role of parenchyma cells in tree embolism recovery 2017

EDITORIAL EXPERIENCE-PROFESSIONAL AFFILIATIONS

Associate Editor in Frontiers in Plant Biophysics and Modeling (Frontiers, Zurich; open access journal www.frontiersin.org)

Referee for: Acta Physiologiae Plantarum, American Journal of Botany, Biologia Plantarum, Frontiers in Plant Biophysics and Modeling, Functional Plant Biology, Journal of Experimental Botany, New Phytologist, Physiologia Plantarum, Plant Physiology and Biochemistry, Plant Physiology, Trees, Tree Physiology, Tree Structure and Function, Plant Cell & Environment

TEACHING EXPERIENCE

- Plant ecophysiology (in Soil plant climate system modeling) University of Turin, Faculty of Agronomy, Master degree in Scienze agrarie since 2015

- Principles of Plant Physiology (in Forest Chemistry and Vegetal Physiology), University of Turin, Faculty of Agronomy, Laurea degree in Scienze forestali e ambientali since 2015

PUBLICATIONS

- Zwieniecki MA, **Secchi F (2017)** in Chaumont F, Tyerman SD (eds.). Plant Aquaporins, Signaling and Communication in Plants, DOI 10.1007/978-3-319-49395-4_11. Chapter 11: Role of Aquaporins in the Maintenance of Xylem Hydraulic Capacity. ISBN: 978-3-319-49393-0.
- Sperling O, **Secchi F**, Godfrey J, Zwieniecki MA (2017) Acclimation of *Pistacia integerrima* trees to frost in semi-arid environments depends on autumn's drought. *Planta* 245(3): 671-679
- **Secchi F**, Pagliarani C, Zwieniecki MA (2017). Functional role of xylem parenchyma cells and aquaporins during recovery from severe water stress. *Plant Cell and Environment* doi: 10.1111/pce.12831
- **Secchi F***, Zwieniecki MA (2016). Accumulation of sugars in the xylem apoplast observed under water stress conditions is controlled by xylem pH. *Plant Cell and Environment* 39: 2350-2360
- **Secchi F***, Schubert A, Lovisolo C (2016). Changes in air CO₂ concentration differentially alter transcript levels of NtAQP1 and NtPIP2;1 aquaporin genes in tobacco leaves. *International Journal of Molecular Sciences* 17(4): 56.
- Stein O, Damari-Weissler H, **Secchi F**, Rachamilevitch S, German M, Yeselson Y, Amir R, Schaffer A, Holbrook M, Aloni R, Zwieniecki M, Granot D (2016). The tomato plastidic fructokinase SIFRK3 plays a role in xylem development. *New Phytologist* 209: 1484-1495
- Sperling O, Earles M, **Secchi F**, Godfrey J, Zwieniecki MA (2015). Frost induces respiration and accelerates carbon depletion in trees. *PLoS One* 10 (12): e0144124
- Zwieniecki MA, **Secchi F (2015)**. Threats to xylem hydraulic function of trees under 'new climate normal' conditions. *Plant Cell and Environment* 38: 1713-1724
- **Secchi F***, Zwieniecki MA (2014). Down-regulation of PIP1 aquaporin in poplar trees is detrimental to recovery from embolism. *Plant Physiology* 164: 1789-1799
- Kelly G, Sade N, Attia Z, **Secchi F**, Zwieniecki MA, Holbrook NM, Moshelion M, Granot D (2014). Relationship between hexokinase and the aquaporin PIP1 in the regulation of photosynthesis and plant growth. *PLOS ONE* 9(2): e87888.
- **Secchi F***, Zwieniecki MA (2013). The Physiological response of *Populus tremula x alba* leaves to the down-regulation of PIP1 aquaporin gene expression under no water stress. *Frontiers Plant Science* 4: 507
- **Secchi F***, Perrone I, Chitarra W, Zwieniecka AK, Lovisolo C, Zwieniecki MA (2013). The dynamics of embolism refilling in ABA-deficient tomato plants. *International Journal of Molecular Sciences* 14 (1): 359-377
- Zwieniecki MA, **Secchi F (2012)**. Getting variable xylem hydraulic resistance under control - interplay of structure and function. *Tree Physiology* 32: 1431-1433
- **Secchi F***, Zwieniecki MA (2012). Analysis of xylem sap from functional (non-embolized) and non-functional (embolized) vessels of *Populus nigra* - chemistry of refilling. *Plant Physiology* 160: 955-964
- **Secchi F***, Gilbert ME, Zwieniecki MA (2011). Transcriptome response to embolism formation in stems of *Populus trichocarpa* provides insight into signaling and biology of refilling. *Plant Physiology* 157: 1419-1429
- **Secchi F***, Zwieniecki MA (2011). Sensing embolism in xylem vessels: the role of sucrose as a trigger for refilling. *Plant Cell and Environment* 34: 514-524

- **Secchi F***, Zwieniecki MA (2010). Patterns of PIP gene expression in *Populus trichocarpa* during recovery from xylem embolism suggest a major role for the PIP1 aquaporin subfamily as moderators of refilling process. *Plant Cell and Environment* 33: 1285-1297
- **Secchi F***, MacIver B, Zeidel ML, Zwieniecki MA (2009). Functional analysis of putative genes encoding the PIP2 water channel subfamily in *Populus trichocarpa*. *Tree Physiology* 29: 1467-1477
- Pou A, Flexas J, Alsina MD, Bota J, Carambula C, de Herralde F, Galmes J, Lovisolo C, Jimenez M, Ribas-Carbo M, Rusjan D, **Secchi F**, Tomas M, Zsofi Z, Medrano H (2008). Adjustments of water use efficiency by stomatal regulation during drought and recovery in the drought-adapted Vitis hybrid Richter-110 (*V. berlandieri* x *V. rupestris*). *Physiologia Plantarum* 134: 313-323
- **Secchi F***, Lovisolo C, Uehlein N, Kaldenhoff R, Schubert A (2007). Isolation and functional characterization of three aquaporins from olive (*Olea europaea* L.). *Planta* 225: 381-392
- **Secchi F**, Lovisolo C, Schubert A (2007). Expression of OePIP2.1 aquaporin gene and water relations of *Olea europaea* twigs during drought stress and recovery. *Annals of Applied Biology* 150: 163-167
- Lovisolo C§, **Secchi F§**, Nardini A, Salleo S, Buffa R, Schubert A (2007). Expression of PIP1 and PIP2 aquaporins is enhanced in olive dwarf genotypes and is related to root and leaf hydraulic conductance. *Physiologia Plantarum* 130: 543-551
- Dolci P, Guglielmo F, **Secchi F**, Ozino OI (2006). Persistence and efficacy of *Beauveria brongniartii* strains applied as biocontrol agents against *Melolontha melolontha* in the Valley of Aosta (Northwest Italy). *Journal of Applied Microbiology* 100: 1063-1072

*corresponding author; § equal contribution

OTHER PUBLICATIONS

- Dolci P, Ozino OI, Guglielmo F, Prato P, Secchi F, 2002. Growth and persistence in the Aosta Valley of highly virulent and genetically recognizable strains of the entomopathogenic fungus *Beauveria brongniartii*. Integrated control of soil pests. Aosta, 14-16 settembre, "Melolontha, IOBC wprs Bulletin, 25, 97-101.
- Guglielmo F, Dolci P, **Secchi F**, Rosset R, Bonfanti R (2007). Prove di lotta microbiologica contro il maggiolino. *L'Informatore Agricolo*, 23(4): 26-30.
- Caruso T, Motisi A, Buffa R, Lo Gullo MA, Ganino T, **Secchi F**, Salleo S. (2006). Meccanismi coinvolti nel controllo della crescita vegetative dell'olivo attraverso l'impiego del portainnesto. *Frutticoltura* 3: 51-55.

CONTRIBUTED AND INVITED TALKS

- Pagliarani C, Ashofteh Beiragi M, Cavalletto S, Zwieniecki MA, Strano T, Schubert A, **Secchi F**. 2016 (**Oral contribution**). Acidification of xylem sap pH observed in droughted trees provides apoplastic environment for facilitating recovery processes. FISV 2016. Roma, Italy, 20-23 September.
- **Secchi F**, Sperling O, Pagliarani C, Ferrandini A, Zwieniecki MA. 2015 (**Oral contribution**). Down-regulation of PIP1 aquaporins interferes with plant's ability to recover from water stress. Joint Congress SIBV-SIGA, Milano, Italy, September 8-11.

- **Secchi F, Sperling O, Zwieniecki MA. 2014 (Oral contribution)** Down-regulation of PIP1 aquaporins interferes with plant's ability to recover from drought-induced embolism and reduced stomatal conductance. 99th ESA Annual Convention, Sacramento, California, August 10-15.
- **Secchi F. 2014 (Oral invited contribution)** Understanding xylem recovery from embolism: molecular and physiological perspectives. SBS Seminar Series, School of Biological Sciences, Pullman, WA, January 22.
- **Secchi F, Zwieniecki MA. 2013 (Oral invited contribution)** Understanding xylem refilling: molecular and physiological perspectives. Botany 2013, New Orleans, Louisiana, USA, July 27-31.
- **Secchi F, Zwieniecki MA. 2013 (Oral contribution)** Chemistry of xylem embolism refilling. International Symposium on Wood Structure in Plant Biology and Ecology (WSE), Naples, Italy 17-20.