

Curriculum Vitae et Studiorum

Giovannelli Alessio holds the MD in Forest Sciences (110/110) at the University of Florence (1993) and the Postgraduate Diploma in Plant Biotechnology at the University of Pisa (1996).

He received national CNR-fellowships at the IMGPF of Florence (1994, 1996, 1998-2000), long and short-term fellowships (1 year-1 month) at the Station d'Amelioration des Arbres Forestières - INRA Orléans (France) and at the Département des Sciences de l'Université du Québec fondamentales - Canada (1 month).

Since 2001 he is confirmed Researcher at CNR and carries out research activities at the Tree and Timber Institute - (IVALSA) in Florence where he is responsible of the Laboratory "Xylogenesi".

He was appointed "Professeur Associé" and PhD co-director in Environmental Science (program 3669) at Département des Sciences Fundamentales, Université du Québec - Canada (2010-2013).

He received habilitation to Associate Professor in Arboriculture and forest systems (disciplinary area 07/B2) for 2014-2020.

SPECIALIZATION AND RESEARCH INTERESTS

The research focuses on the study of the physiological mechanisms involved in wood formation (xylogenesi) in forest species. In our research the cambial region represents a biological model in which the processes of growth (cell division) and differentiation (expansion, programmed cell death and lignification) are investigated through anatomy, biochemistry and molecular biology. The main objective is to define when and how the environmental stresses such as water shortage and warming can influence the cambium activity and the xylem traits. The effects of water deficit and warming are studied in poplar (model species), *Picea abies*, *Picea mariana* and olive to investigate: 1) the intra-annual ring growth and the stem water relations; 2) the source-sink relationships for carbon (non-structural carbohydrates); 3) the molecular mechanisms involved in the response to abiotic stresses (transcriptome analyses) in cambium; 3) the hydraulic architecture of the xylem.

MEMBER OF EDITORIAL BOARDS

Editorial board: *Frontiers in Functional Plant Ecology* (2012-present)

Review board (journals): *Journal of Plant Growth Regulation*, *New Zealand Journal of Crop and Horticultural Science*, *Journal of Forest Science*, *Oecologia*, *Biomassa and Bioenergy*, *Biologia Plantarum*, *Journal of Experimental Botany*, *Frontiers in Functional Plant Ecology*, *iForest*, *Annals of Botany*, *Environmental pollution*, *New Forest*.

Proposal reviewer (funding agencies): 1) APART: Austrian Programme for Advanced Research and Technology (2013); 2) Le STUDIUM – Region Centre Laboratories application – CNRS (France) (2012)

HONOURS, AWARDS, FELLOWSHIPS

April 2005 Visiting scientist – Bilateral project for scientific cooperation "Galileo" CRUI-EGIDE (Italy- France), Orléans, France: Study on the adaptation to environmental changes within the *Populus* genus: Effect of the water stress on the gene expression.

March 2009 Fellowship (short-term mobility) CNR, Visiting Scientist, Département des Sciences Fondamentales de l'Université du Québec – Canada. Procedure di estrazione dei ritmi circadiani per la valutazione degli effetti dei fattori ambientali nella dinamica intra-annuale di formazione dello xilema in piante d'interesse agrario e forestale.

June 2010 Visiting scientist – Département des Sciences Fondamentales de l'Université du Québec – Canada. Project: Effets de la température et d'un stress hydrique sur la xylogénèse, la dynamique d'utilisation des glucides et la qualité du bois de l'épinette noire.

INSTITUTIONAL ACTIVITY

- 2007- present: CNR delegate in the Scientific Committee for forest species - ARSIA, Regione Toscana.
- Leader of CNR-IVALSA Activity “Fisiologia dell'adattamento allo stress idrico in olivo” (AG.P04.019.004)

PROJECTS

Participant

- 1) Project ECLAIR – European commission contract FAIR-CT98-4822. Upgrading the genetic quality of hardwoods by selection of elite germplasm and conservation on marginal and abandoned farmland (participant WP, 1993-1994);
- 2) Progetto Finalizzato RAISA-CNR, Consiglio Nazionale delle Ricerche (participant WP, 1996);
- 3) Program “Galileo” CRUI-EGIDE. Study on the adaptation to environmental changes within the *Populus* genus: Effect of the water stress on the gene expression (2004-2005);
- 4) COST Action E 28 "Genosilva". Italian delegate WG1. Wood Formation (2003-2006)
- 5) Agreement CNR-IVALSA/ARSIA Toscana. Valorization of pear and olive germoplasm for wood production (2004-2005, participant WP)
- 6) Project Strategique CRSN – Canada. Effets de la température et d'un stress hydrique sur la xylogénèse, la dynamique d'utilisation des glucides et la qualité du bois de l'épinette noire. (2009-2013, Foreign Expert).
- 7) Project EUROCHAR – FP 7 Environment “Biochar for Carbon sequestration and large-scale removal of greenhouse gases (GHG) from the atmosphere” (2010-2013, participant WP)

Task leader

- 1) Agreement CNR-PAT, Project SOFIE2. Edilizia sostenibile: grandi prove, produzione e caratterizzazione del legno trentino (Leader task Attività A2. 2007-2010)
- 2) Project Premiale “AQUA” CNR. Gestione sostenibile della risorsa acqua in agricoltura (2014-2015, Leader task 3.3 “*Effetto del deficit idrico sulla regolazione dell'attività meristemica e sulla funzionalità xilematica in specie da biomassa*”)

Scientific Leader

- 1) Project “Global change, water resources and wood quality: new strategies for poplar” contract n° 2007.0799 - Ente Cassa di Risparmio di Firenze (2008-2009);
- 2) Project Sysbiofor, “System biology of the plant response mechanisms to climate change: models for the development of biotechnology and agro-forestry applications for biomass production” POR CRO FSE 2017-2013 Asse IV Capitale umano. Regione Toscana (2012-2014)

TUTORING

Encharge of Tutor for Degree students: Giovan Battista Goletti – Università degli Studi della Tuscia, Viterbo; Guido Giachi – Università degli studi di Firenze, Dipartimento chimica; Fanny Tremlaut – Université d'Orléans, Erasmus; Giustina Rotordam - Università degli studi di Firenze, Dipartimento Genetica Evolutiva

Encharge of Tutor for CNR grants: Dr. Emiliani Giovanni; Lucia Basile

Encharge of Tutor for PhD students: Grazia Pallara, Dipartimento Biotecnologie Agrarie, Università di Firenze

Direction and co-direction of PhD thesis: Lorena Balducci, Departement des Sciences Fundamentales, Université du Québec – Canada (co-direction)

Publications JCR (2010-2014)

1. Berta M., Giovannelli A., Sebastiani F., Camussi A., Racchi M.L. (2010). Transcriptome changes in the cambial region of poplar (*Populus alba* L.) in response to water deficit. *Plant Biology* 12: 341-354. (I.F. 2.409 – Q1, plant science).
2. Terzoli S., Beritognolo I., Giovannelli A., Benelli C., Migliaccio F., Piconese S., Sabatti M., Kuzminsky E., Scarascia Mugnozza G. (2011). Expression of Aux/IAA genes during development of sylleptic and proleptic buds in white poplar. *Plant Biosystem* 145(2): 370-380 (I.F. 1.418 – Q2, plant sciences).
3. Giovannelli A., Emiliani G., Traversi M.L., Deslauriers A., Rossi S. (2011). Sampling cambial region and mature xylem for non structural carbohydrates and starch analyses. *Dendrochronologia* 29: 177-182 (I.F. 1.525 – Q2, forestry).
4. Coccozza C., Giovannelli A., Traversi M.L., Castro G., Cherubini P., Tognetti R. (2011). Do tree-ring traits reflect different water deficit responses in young poplar clones (*Populus x canadensis* Mönch 'I-214' and *P. deltoides* 'Dvina')? *Trees – structure and function* 25: 975-985 (I.F. 1.685 – Q1, forestry)
5. Emiliani G., Traversi M.L., Anichini M., Giachi G., and Giovannelli A. (2011). Gene expression dynamic of phenylpropanoid pathway genes in the maturing xylem and phloem of *Picea Abies* K. during latewood formation. *Journal of Integrative Plant Biology* 53: 783-799 (I.F. 2.534 – Q2, plant sciences)
6. Pallara G., Giovannelli A., Traversi M.L., Camussi A., Racchi ML. (2012). Effect of water deficit on expression of stress related genes in the cambial region of two contrasting poplar clones. *Journal of Plant Growth Regulation* 31: 102-112 (I.F. 1.990 – Q2, plant sciences)
7. Coccozza C., Giovannelli A., Lasserre B., Cantini C., Lombardi F., Tognetti R. (2012). A novel mathematical procedure to interpret the stem radius variation in olive trees. *Agricultural and Forest Meteorology* 161: 80-93 (I.F. 3.421 - Q1, forestry)
8. Pintucci C., Giovannelli A., Traversi M.L., Ena A., Padovani G., Carlozzi P. (2013). Fresh olive mill waste deprived of polyphenols as feedstock for hydrogen photo-production by means of *Rhodospseudomonas palustris* 42OL. *Renewable Energy* 51: 358-363 (I.F. 3.361- Q1 Energy & Fuels)
9. Sorce C., Giovannelli A., Sebastiani L., Anfodillo T. (2013). Hormonal signals involved in the regulation of cambial activity, xylogenesis and vessel patterning in trees. *Plant Cell report* 32: 885-898. (I.F. 2.936- Q1 Plant science)
10. Simard S., Giovannelli A., Treydte K., Traversi ML., King M., Frank D., Fonti P. (2013). Intra-annual dynamics of non-structural carbohydrates in the cambium of mature conifer trees reflects radial growth demands. *Tree Physiology* 33: 913-923. (I.F. 3.405- Q1 Forestry)
11. Balducci L., Deslauriers A., Giovannelli A., Rossi S., and Rathgeber C.B.K. (2013). Effects of temperature and water deficit on cambial activity and woody ring features in *Picea mariana* saplings. *Tree Physiology* 33: 1006-1017 (I.F. 3.405- Q1 Forestry)
12. Marino, G., Pallozzi, E., Coccozza, C., Tognetti, R., Giovannelli, A., Cantini, C., Centritto, M., (2014). Assessing gas exchange, sap flow and water relations using tree canopy spectra reflectance indices in irrigated and rainfed *Olea europaea* L.. *Environmental and Experimental Botany*, 99: 43-52. (I.F. 3.003 - Q1 plant science - dato riferito al 2013).

13. Luisi A., Giovannelli A., Traversi M.L., Anichini M., Sorce C. (2014). Hormonal response to water deficit in cambial tissue of *Populus alba* L. *Journal of Plant Growth Regulation*, 33: 489-498. (I.F. 2.058- Q2 Forestry - dato riferito al 2013)
14. Deslauriers A., Beaulieu M., Balducci L., Giovannelli A., Gagnon M.J., Rossi S. (2014). Impact of warming and drought on carbon balance related to wood formation in black spruce. *Annals of Botany* 114: 335-345 (I.F. 3.295- Q1 Plant sciences - dato riferito al 2013)
15. Balducci L., Deslauriers A., Giovannelli A., Beaulieu M., Delzon S., Rossi S., Rathgeber B. K. (in press, 2014). How do drought and warming influence survival and wood traits of *Picea mariana* saplings? *Journal of Experimental Botany* 66: 377-389 (I.F. 5.794- Q1 Environmental sciences - dato riferito al 2013)
16. Coccozza C., Marino G., Giovannelli A., Cantini C., Centritto M., Tognetti R. (in press, 2014). Simultaneous measurements of stem radius variation and sap flux density reveal synchronization of water storage and transpiration dynamics in olive trees. *Ecohydrology* 8: 33-45. (I.F. 2.634- Q1 Environmental sciences - dato riferito al 2013).

Top 10 papers

1. **Giovannelli A.**, Deslauriers A., Fragnelli G., Scaletti L., Castro G., Rossi S. and Crivellaro A. (2007). Evaluation of drought response of two poplar clones (*Populus x canadensis* Mönch ‘I-214’ and *P. deltoides* Marsh. ‘Dvina’) through high resolution analysis of stem growth. *Journal of Experimental Botany*, 58: 2673-2683. (I.F. 3.917 – Q1, plant sciences)
2. Tognetti R., **Giovannelli A.**, D’Andria R., Lavini A., Morelli G (2009). Assessing adaptive strategies to long term irrigation deficit in a model olive tree (*Olea europea* L.) plantation through soil-plant-atmosphere monitoring. *Agricultural and Forest Meteorology* 149: 1229-1243. (I.F. 3.197 – Q1, forestry).
3. Coccozza C., Lasserre B., **Giovannelli A.**, Castro G., Fragnelli G., Tognetti R. (2009). Low temperature induces different cold sensitivity in two poplar clones (*Populus x canadensis* Mönch ‘I-214’ and *P. deltoides* Marsh. ‘Dvina’). *Journal of Experimental Botany* 60: 3655-3664. (I.F. 4.271 – Q1, plant sciences)
4. Coccozza C., **Giovannelli A.**, Lasserre B., Cantini C., Lombardi F., Tognetti R. (2012). A novel mathematical procedure to interpret the stem radius variation in olive trees. *Agricultural and Forest Meteorology* 161: 80-93. (I.F. 3.421 - Q1, forestry)
5. Pintucci C., **Giovannelli A.**, Traversi M.L., Ena A., Padovani G., Carlozzi P. (2013). Fresh olive mill waste deprived of polyphenols as feedstock for hydrogen photo-production by means of *Rhodospseudomonas palustris* 42OL. *Renewable Energy* 51: 358-363 (I.F. 3.361- Q1 Energy & Fuels)
6. Sorce C., **Giovannelli A.**, Sebastiani L., Anfodillo T. (2013). Hormonal signals involved in the regulation of cambial activity, xylogenesis and vessel patterning in trees. *Plant Cell report* 32: 885-898. (I.F. 2.936- Q1 Plant science)
7. Simard S., **Giovannelli A.**, Treydte K., Traversi M.L., King M., Frank D., Fonti P. (2013). Intra-annual dynamics of non-structural carbohydrates in the cambium of mature conifer trees reflects radial growth demands. *Tree Physiology* 33: 913-923. (I.F. 3.405- Q1 Forestry)
8. Balducci L., Deslauriers A., **Giovannelli A.**, Rossi S., and Rathgeber C.B.K. (2013). Effects of temperature and water deficit on cambial activity and woody ring features in *Picea mariana* saplings. *Tree Physiology* 33: 1006-1017 (I.F. 3.405- Q1 Forestry)
9. Deslauriers A., Beaulieu M., Balducci L., **Giovannelli A.**, Gagnon M.J., Rossi S. (2014). Impact of warming and drought on carbon balance related to wood formation in black spruce. *Annals of Botany* 114: 335-345 (I.F. 3.295- Q1 Plant sciences - dato riferito al 2013)

10. Balducci L., Deslauriers A., **Giovannelli A.**, Beaulieu M., Delzon S., Rossi S., Rathgeber B. K. (*in press*). How do drought and warming influence survival and wood traits of *Picea mariana* saplings? *Journal of Experimental Botany* 66: 377-389 (*I.F. 5.795- Q1 Plant sciences - dato riferito al 2013*)