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## Career objectives

PhD in Terrestrial ecology with research background in field experiments and observations on the effects of global change on forests. My immediate objective is to expand my research skills to the analysis of broad geographical scale ecological data during my postdoctoral training and to eventually gain a stable position in plant ecology research.

## Education

**Doctor of Philosophy**, Terrestrial Ecology, Autonomous University of Barcelona. 2015.
"The acclimation mechanisms of forest structure and function to long-term drought".
Supervisors: Prof. Josep Peñuelas and Dr. Romà Ogaya.

**Master of Science,** Terrestrial Ecology, Autonomous University of Barcelona.2010.
"The effects of habitat fragmentation on forest demography and health status". Supervisor: Prof. Josep Peñuelas.

**Pedagogical Aptitude Certificate**, specialization in Didactics of Natural Sciences. 2008.

**Bachelor of Science**, Environmental Science Autonomous University of Barcelona 2008.

## Fellowships and awards

- FPI predoctoral fellowship, Spanish Ministry of Science and Innovation. 2011-2015.
- FPI Short stay fellowship. Spanish Ministry of Science and Innovation. 2014. Helmholtz Zentrum, German Center for Geosciencies, Postdam (Germany). Amount: 4000£.
- Short Term Scientific Mission. COST Actions (EU). 2013. Helmholtz Zentrum, German Center for Geosciencies, Postdam (Germany). Amount: 700£.
- FPI Short stay fellowship. Spanish Ministry of Science and Innovation. 2012. University of California at Berkeley. Amount: 4000£.

## Research experience

During the predoctoral period, I gained experience on the following approaches and methodologies:

- Development of a literature review on a specific research field (drought resistance and resilience mechanisms of the holm oak across drought timescales).
- Quantitative synthesis of published data (groundwater contribution to transpiration).

- General methods in dendroecology (field sampling, tree core processing at the lab, tree-ring measurements with WinDendro, cross-dating and analyses of growth-climate relationships).
- Sample preparation and analysis of tree-ring $\delta^{13}C$ and $\delta^{18}O$.
- Field sampling for plant water relation studies using stable isotopes.
- Cryogenic extraction of plant and soil water samples.
- Isotopic determination of water samples (IRIS and IRMS).
- Field measurement of foliar gas exchange (LI-6400XT), leaf water potentials (Scholander chamber), soil moisture, among others.
- Handling with growth and mortality rates data from a long-term experiment.
- Sap flow measurement with heat-tissue balance method.

## Research stays

**University of California at Berkeley.** September 2012-December 2012.Host: Todd E. Dawson (Dept. of Integrative Biology). Aim: Training in stable isotopes techniques in ecology and developing a methodological test of the reliability of water stable isotope analyses. Results were recently published in New Phytologist.

**Helmholtz Centre, German Centre for Geosciences.** October 2013 and March 2014-July 2014. Host: Gerd Helle (Dept. of Landscape Dynamics, Dendro Lab). Aim: To build dendrochronologies of tree-ring width and tree ring stable isotopes of *Quercus ilex* and *Fagus sylvatica.*

## Publications

***Included in SCI***

MARTÍN-GOMÉZ, P., **BARBETA, A.,** VOLTAS, J., PEÑUELAS, J., DENNIS, K., PALACIO, S., DAWSON, T.E., FERRIO, J.P. (2015). Isotope-ratio infrared spectroscopy: a reliable tool for the investigation of plant-water sources? **New Phytologist**. DOI: 10.1111/nph.13376. **Impact Factor: 6.545.**

**BARBETA A.,** MEJÍA-CHANG M., OGAYA R., VOLTAS J., DAWSON T.D., PEÑUELAS J. (2015). The combined effects of a long-term experimental drought and an extreme drought on the use of plant-water sources in a Mediterranean forest. **Global Change Biology** 21: 1213-1225. **Impact Factor: 8.224.**

OGAYA, R., **BARBETA A.,** BASNOU, C., PEÑUELAS, J. (2015) Satellite data as indicators of tree biomass growth and forest dieback in a Mediterranean holm oak forest. **Annals of Forest Science** 72 (1), 135-144. **Impact Factor: 1.536.**

OGAYA, R., LLUSIÀ, J., **BARBETA, A.,** ASENSIO, D., LIU, D., ALESSIO G.A., PEÑUELAS, J. (2014). Foliar CO 2 in a holm oak forest subjected to 15 years of climate change simulation. **Plant Science** 226, 101-107. **Impact Factor: 4.114.**

RICO, L., OGAYA, R., **BARBETA, A.,** PEÑUELAS, J. (2014) Changes in DNA methylation fingerprint of Quercus ilex trees in response to experimental field drought simulating projected climate change. **Plant Biology** 16 (2), 419-427. **Impact Factor: 2.405.**

CARNICER, J., **BARBETA, A.,** SPERLICH, D., COLL, M., PEÑUELAS, J.(2013).Contrasting trait syndromes in angiosperms and conifers are associated with different responses of tree growth to temperature on a large scale. **Frontiers in Plant Science.** 4:409. **Impact Factor: 3.637.**

**BARBETA, A.,** OGAYA, R., PEÑUELAS, J. (2013) Dampening effects of longterm experimental drought on growth and mortality rates of a Holm oak forest. **Global Change Biology** 19 (10), 3133-3144. **Impact Factor: 8.224.**

PEÑUELAS, J., SARDANS, J., ESTIARTE, M., OGAYA, R., CARNICER, J., COLL, M., **BARBETA, A**., RIVAS-UBACH, A., LLUSIÀ, J., GARBULSKY, M., FILELLA, I., JUMP, A.S (2013) Evidence of current impact of climate change on life: a walk from genes to the biosphere. **Global Change Biology** 19 (8), 2303-2338. **Impact Factor: 8.224.**

**BARBETA, A.,** OGAYA, R., PEÑUELAS, J. (2012). Comparative study of diurnal and nocturnal sap flow of Quercus ilex and Phillyrea latifolia in a Mediterranean holm oak forest in Prades (Catalonia, NE Spain). **Trees** 26 (5), 1651-1659. **Impact Factor: 1.869.**

**BARBETA A.,**PEÑUELAS J., OGAYA, R., JUMP, A.S. (2011). Reduced tree health and seedling production in fragmented *Fagus sylvatica* forest patches in the Montseny Mountains (NE Spain). **Forest, Ecology and Management**. 261:2029-2037. **Impact Factor: 2.667.**

***Submitted publications***

**BARBETA A.,** PEÑUELAS J., (2015). Relative contribution of groundwater to plant transpiration estimated with stable isotopes. Submitted to New Phytologist.

***In preparation***

**BARBETA, A.,** OGAYA, R., PEÑUELAS, J. The response of *Quercus ilex* to drought across temporal and organizational scales. Invited review for *Plant Ecology and Diversity.*

**BARBETA, A.,** HELLE, G., PEÑUELAS, J. Tree-ring isotope of two coexisting trees with contrasting drought and temperature sensitivity. Intended for *Tree Physiology.*

RIVAS-UBACH, A., **BARBETA, A.,** SARDANS, J., OGAYA, R., PEÑUELAS, J. The combined effect of experimental drought and soil depth on *Quercus ilex* metabolomics. Intended for *Global Change Biology.*

SPERLICH, D., **BARBETA, A.,** OGAYA, R., SABATÉ, S., PEÑUELAS, J. Balance between carbon gain and carbon loss under long-term drought: impacts on foliar photosynthesis and respiration in Quercus ilex. Intended for *Tree Physiology.*

***Book Chapters***

Barbeta, A., Puig, A., Cortina, M., De Riquer, M. 2011. Proposta de Pla Bàsic per al Centre d'Interpretació Ambiental Terres de Forntera d'Os de Civís (les Valls de Valira). In: Diagnosi Ambiental al Parc Natural de l'Alt Pirineu. Universitat Autònoma de Barcelona, Bellaterra. 2011.

## Congress and workshops participation

Barbeta, A., Ogaya, R., Mejía-Chang M., Rico, L., Voltas, J., Dawson, T.E., Peñuelas, J. 2014. Forest acclimation to drought: Structural, functional and epigenetic changes following a long-term drought experiment. Natural and human-assissted adaptation of forests to climatic constraints: the relevance of interdisciplinary approaches. Orléans, France. November 18-19th.

Peñuelas J., Filella I., Estiarte M., LLusià J., Sardans J., Ogaya R., Carnicer J., Rico L., Verger A., Asensio D., Bartrons M., Kefauver S., Barbeta A., Rivas-Ubach A., Achotegui A., Gargallo A., Sperlich D., Farré G., Liu D., Zhang C., Tao S. 2014. Quantifying the responses of ecosystems and society in a world increasingly rich in N and C but limited in Phosphorus. In: Phosphorus Imbalance in the Terrestrial Biosphere Processes from Root to Globe Meeting. Phosphorus meeting, Montpellier, March 6-7.

Carnicer, J., Barbeta, A., Sperlich, D., Coll, M., Peñuelas, J. 2013 Forest responses to climate change at the large scale: Unraveling the role of forest succession, inter-specific interactions and trait-based strategies (Introductory talk II). ClimTree 2013, Zurich, Sep. 1-5.

Peñuelas, J. Sardans, J., Estiarte, M., Ogaya R., Carnicer, J. Coll, M., Barbeta, A., Rivas-Ubach, A., Gargallo, A., Llusià, J., Rico, L., Achotegui A., Farre-Armengol, G., Filella, I., Jump, A.S. 2013 Nutrients matter most. Genomic, metabolomic and ecophysiological approaches to the study of climate change impacts on communities and ecosystems: from short term to long term responses. Intecol 2013, 18-23 August 2013, ICC London ExCel.

Penuelas, J., Sardans, J., Estiarte, M., Ogaya, R., Carnicer, J., Coll, M., Barbeta, A., Rivas-Ubach, A., Llusià, J., Garbulsky, M., Filella, I., Jump, A.S., 2013 Synergistic complementation among experimental, observational and dendroecological studies for a better understanding of the interactions between climatechange and terrestrialecosystems. Inaugural keynotespeech. TRACE. Tree rings in archeology, climatology and ecology. Viterbo 08-11, 2013, pages 8-9.

Estiarte, M., Peñuelas, J., Ogaya, R., Barbeta, A. 2012 Experimental drought experiments in Garraf and Prades. Results of long-term field experiments. In: Drought and other extreme weather conditions in terrestrial ecosystems, CLIMANI workshop. Dubrovnik, Croatia. June 6-8.

Jump, A.S., Cavin, L., Barbeta, A., Ogaya, R., Peñuelas, J. 2011 Tree growth decline and range retraction in mountain forests and implications for lowland regions. British Ecological Soc. meeting in Cambridge, 28th - 30th March.

Jump, A.S., Barbeta, A., Ogaya, R., Peñuelas, J. 2011 Interactions between genetics and demography in forest fragmentation. Population Biology meeting. Cambridge, June 2011.

## Relevant work experience

- **PhD candidate** at the Global Ecology Unit CREAF-CSIC. *January 2011 - present.* Developing a Doctoral thesis entitled “The acclimation mechanisms of forest structure and function to long-term drought”.
- **Environmental technician** at the Sant Andreu de Llavaneres (Barcelona) town council. *October 2009 - January 2011*. Tasks consisted of the management of urban green areas, the solid waste system and the local plan of environmental actions “Agenda 21”.
- **Research assistant** at the Global Ecology Unit CREAF-CSIC. *January 2010 - January 2011*. Collaboration in field work campaigns related to forest ecology research.

- **Environmental instructor** at several companies. *June 2007 – June 2009, seasonal work*. I led naturalistic excursions with high and middle school groups, mainly within Montseny and Eastern Pyrenees mountains (NE Spain).
- **Research assistant** at CREAF - Department of Ecology of the Autonomous University of Barcelona. *February 2008 - May 2008*. Collaboration in field campaigns of studies about the response of Mediterranean ecosystems to drought and thinning.
- **Biological technician** at Tecnigral S.A. *September 2007 – January 2008*. Tasks consisted of inventorying and health status assessing of the urban tree-lines of Barcelona.