

Curriculum vitae
PEDRO VILLAR-SALVADOR

WORK ADDRESS

Forest Ecology and Restoration Group
Department of Life Sciences
Universidad de Alcalá
Alcalá de Henares, 28805 Madrid (SPAIN)
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Researcher ID: L-1380-2014

EDUCATION

- BSc in Biology, 1990. University of Valencia (Spain).
- PhD in Biology, 2000. Title of the thesis: Ecological and functional strategies of xylem in Mediterranean woody species. University of Valencia (Spain).

PRESENT POSITION

Associate professor in Ecology at the University of Alcalá since 2005

APPOINTMENTS

Position	Institution	
Biologist (contracted)	C.S.I.C., Instituto Pirenaico de Ecología (Zaragoza, Spain)	1993
Researcher (contracted)	Empresa de Transformaciones Agrarias (TRAGSA) (Guadalajara, Spain)	1995-1996
Researcher (as a freelance)	National Centre of Forest Improvement "El Serranillo", Spanish Ministry of Environment (Guadalajara, Spain)	1997-2005
Assistant professor in Ecology	University de Alcalá (Madrid, Spain)	2000-2004

MAIN RESEARCH TOPICS

Ecophysiology and functional ecology of plants, nursery plant cultivation and afforestation, woodland restoration and regeneration, plant colonization and seed dispersal.

RESEARCH PROJECTS AND CONTRACTS (IN THE LAST 5 YEARS)

Contract title: Design and performance of ecosystem restoration projects

Financing entity: Contract with the International foundation for Ecosystem Restoration (FIRE). 15.000 €. Duration: 2017-2019. PI: Pedro Villar-Salvador. University of Alcalá. Number of involved researchers: 8 of the University of Alcalá.

Project title: Program for contracting research assistants and technicians

Financing entity: Community of Madrid and European Union. 45.000 €. Duration: 2017-2019. PI: Pedro Villar-Salvador. University of Alcalá.

Project title: Ecosystem services provided by birds (high mobile link species) in farmland and forest mosaics: forest regeneration and plague regulation (CGL2014-53308-P).

Financing entity: Spanish Ministry of Economy. 180.000 €. Duration: 2015-2019. PI: Salvador Rebollo and José M^a Rey Benayas. Number of involved researchers: 5 of the University of Alcalá and the University of Granada.

Contract title: Strategies and techniques for Agroecosystems restoration

Financing entity: FIRE (International Foundation for Ecological Restoration). 12.000 €
Duration: Nov. 2016- Nov. 2017. PI: Pedro Villar-Salvador. Number of involved researchers: 6

Contract title: Strategies and techniques for Agroecosystems restoration

Financing entity: FIRE (International Foundation for Ecological Restoration). 12.000 €
Duration: Nov. 2015- Nov. 2016. PI: Pedro Villar-Salvador. Number of involved researchers: 6

Project title: Ecosystem services provided by birds (high mobile link species) in farmland: seed dispersal and pests regulation CG2014/BIO-004.

Financing entity: University of Alcalá. 9000 €. Duration: 2015. PI: Salvador Rebollo. Number of involved researchers: 6.

Project title: Research + Development activities of the Community of Madrid on the restoration of natural environment. REMEDINAL 3 (S2013/MAE-2719).

Financing entity: Government of the Community of Madrid (300.000 €, of which 45.000 € are for the University of Alcalá). Duration: 2014-2017. PI: Adrián Escudero, Number of involved research centers: 7 Researchers of the University of Alcalá: 10.

Project title: Tolerance and ecophysiological strategies of Iberian pines at juvenile stages to drought, low temperature and nutrient availability (AGL2011-24296)

Financing entity: Spanish Ministry of Science and Innovation (145.000 euros). Duration: November 2011 to December 2014, PI: Pedro Villar Salvador. Number of involved researchers: 5 institutions, 6 researchers

PEER-REVIEWED PAPERS (IN THE 10 LAST YEARS)

- W. Shi, Villar-Salvador P., Li G., Jiang, X. 2019 Acorn size is more important than nursery fertilization for field performance of planted *Quercus variabilis* seedlings Annals of Forest Science (in press)
- V. Cruz-Alonso, Ruiz-Benito P., Villar-Salvador P., Rey-Benayas, J. M. 2019. Long-term recovery of Mediterranean forests depends on restoration strategy and forest type. Journal of Applied Ecology (in press)

- J. Wang, **Villar-Salvador P.**, Liu Y., Li G. 2019. Water stress does not inhibit nitrogen remobilization allowing high growth in high nitrogen content *Quercus variabilis* seedlings under drought conditions *Tree Physiology* (in press).
- E. Andivia, Zuccarini P., Grau B, De Herralde F., **Villar-Salvador P.**, Savé R. 2019. Rooting big and deep rapidly: the ecological roots of pine species distribution in southern Europe. *Structure and Function* (in press).
- E. Andivia, **Villar-Salvador P.**, Oliet J., Puértolas J., Dumroese K. 2019. How can my paper be useful for future meta-analysis on forest restoration plantations? *New Forests* (in press)
- E. Andivia, Madrigal-González J., Villar-Salvador P., Zavala, M.A. 2018. Does facilitation from adult conspecifics increase sapling resilience to repeated droughts in water-limited pine forest? *Ecosphere* 9(6): article e02282.
- D. Salazar-Tortosa, Castro J., **Villar-Salvador P.**, Viñegla B., Matías L., Michelsen A., Rubio de Casas R., Querejeta, I. 2018. The “isohydric trap”: a proposed feedback between water shortage, stomatal regulation and nutrient acquisition drives differential growth and survival of European pines under climatic dryness. *Global Change Biology* 24: 4069-4083
- D. Salazar-Tortosa, Castro J., De Casas R.R., Viñegla-Pérez B., Sánchez-Cañete E.P., **Villar-Salvador P.** 2018. Gas exchange at whole plant level shows that a less conservative water use is linked to a higher performance in three ecologically distinct pine species. *Environmental Research Letters* 13: 045004.
- L. Fernández-Pérez, **Villar-Salvador P.**, Martínez-Vilalta J., Toca A.O., Zavala M.A 2018 Distribution of pines in Iberia Peninsula agrees with seedling differences in foliage frost tolerance, not with xylem embolism vulnerability. *Tree Physiology* 38:507-516.
- W. Shi, **Villar-Salvador P.**, Jacobs D.F., Li G., Jang X. 2018. Simulated predation of *Quercus variabilis* acorns impairs nutrient remobilization and seedling performance irrespective of soil fertility. *Plant and Soil* 423:295–306
- A.O. Toca, Oliet J.A., **Villar-Salvador P.**, Maroto J., Jacobs, D.F. 2018. Species ecology determines the role of nitrogen nutrition on the frost tolerance of pine seedlings. *Tree Physiology* 38: 96-108.
- J. Castro, Molina-Morales M., Leverkus A.B., Martínez L., Pérez-Camacho L., **Villar-Salvador P.**, Rebollo S, Rey-Benayas J.M. 2017. Effective nut dispersal by magpies (*Pica pica* L.) in a Mediterranean agroecosystem. *Oecologia* 184: 183-192.
- E. Andivia, **Villar-Salvador P.**, Tovar L., Rabasa S., Rey-Benayas J.M. 2017. Multiscale assessment of woody species recruitment in Mediterranean shrublands: facilitation and beyond. *Journal of Vegetation Science* 28: 639-648.
- M. Uscola, **Villar-Salvador P.**, Oliet J., Warren Ch. 2017 Root uptake of inorganic and organic N chemical forms in two coexisting Mediterranean forest trees. *Plant and Soil* 415:387-392
- L. Matías, Castro J., **Villar-Salvador P.**, Quero J.L., Jump A.S. 2016. Differential impact of hotter drought on seedling performance of five ecologically distinct pine species. *Plant Ecology* 218:201-212.
- **P. Villar-Salvador 2016.** Restoration of Spanish pine plantations: A main challenge for the 21st century. *Reforesta* 1:53-66.
- M. Uscola, **Villar-Salvador P.**, Maillard, P. y Gross, P. 2015. Fast growth involves high dependence on stored resources in seedlings of Mediterranean evergreen trees. *Annals of Botany* 115: 1001-1013
- **P. Villar-Salvador**, Uscola, M. Jacobs, D.F. 2015 The role of stored carbohydrates and nitrogen in the growth and stress tolerance of planted forest trees. *New Forests* 46: 813-839.

- J.M. Rey Benayas, Martínez, L., Pérez-Camacho, L., **Villar-Salvador, P.**, Holl, K.D. 2015. Predation and aridity slow down the spread of 21-year-old planted woodland islets in restored Mediterranean farmland. *New Forests* 46: 841-853.
- N. Heredia, Oliet J., **Villar-Salvador P.**, Benito, Luis F., Peñuelas J.L. Fertilization regime interacts with fall temperature in the nursery to determine the frost and drought tolerance and nutrient status of the Mediterranean oak *Quercus ilex* L. *Forest Ecology and Management* 311:50-59.
- M. Uscola, **Villar-Salvador P.**, Oliet J., Warren C. 2014. Foliar absorption and root translocation of nitrogen from different chemical forms in seedlings of two Mediterranean trees. *Environmental and Experimental Botany* 104:34-41.
- M. Uscola, Oliet J., **Villar-Salvador P.**, Díaz-Pinés E., Jacobs D. 2014 Nitrogen form and concentration interact to affect the performance of two ecologically distinct Mediterranean forest trees. *European Journal of Forest Research* 133:235–246.
- **P. Villar-Salvador**, Peñuelas, J.L., Nicolás-Peragón, Fernando-Benito, L.F. Peñuelas, J.L. 2013 Is nitrogen fertilization in the nursery a suitable tool for enhancing the performance of Mediterranean oak plantations? *New Forests* 44:733-751.
- **P. Villar-Salvador**; Peñuelas J.L., Jacobs D. 2013. Nitrogen fertilisation and drought hardening exert opposite effects on the stress tolerance of *Pinus pinea* L. seedlings *Tree Physiology* 33: 221-232.
- **P. Villar-Salvador**, Puértolas J., Cuesta B., Peñuelas J.L; Uscola M., Heredia N., Rey Benayas, J. 2012. Increase in size and nitrogen concentration enhances seedling survival in Mediterranean plantations. Insights from an ecophysiological conceptual model of plant survival. *New Forests*. 43: 755-770.
- D. Montesinos, **Villar-Salvador P.**, García-Fayos P., Verdú, M. 2012. Genders in *Juniperus thurifera* have different functional responses to variations in nutrient availability. *New Phytologist* 193: 705-712.
- B. Cuesta; Rey Benayas J.M., Gallardo A., **Villar-Salvador P.**, González-Espinosa M. 2012. Soil chemical properties in abandoned Mediterranean cropland after succession and oak reforestation. *Acta Oecologica* 38: 58-65.
- J. Climent, Pardos, M. Chambel, M.R., Lario, F., **Villar-Salvador, P.** 2011. Biomass allocation and foliage heteroblasty in hard pine species respond differentially to reduction in rooting volume. *European Journal of Forest Research* 130: 841-850.
- B. Cuesta, Vega J., **Villar-Salvador P.**, Rey-Benayas JM. 2010. Root growth dynamics of Aleppo pine (*Pinus halepensis* Mill.) seedlings in relation to shoot elongation, plant size and tissue nitrogen concentration. *Trees. Structure and Function* 24:899–908.
- B. Cuesta, **Villar-Salvador P.**, Puértolas J., Jacobs, D. Rey Benayas J.M. 2010. Why do large, nitrogen rich seedlings better resist stressful transplanting conditions? A physiological analysis in two functionally contrasting Mediterranean forest species *Forest Ecology and Management* 260:71-78.
- J.M. Rey Benayas, Escudero A., Martín Duque J.F., Nicolau J.M., **Villar-Salvador P.**, García de Jalón D. Balaguer L. 2010. A multi-institutional Spanish Master in Ecosystem Restoration: vision and four-year retrospective *Ecological Restoration* 28:188-192.
- J.G. Hodgson, M. Sharafi, A. Jalili, S. Díaz, G. Montserrat-Martí, C. Palmer, B. Cerabolini, S. Pierce, B. Hamzehee, Y. Asri, Z. Jamzad, P. Wilson, J. A. Raven, S. R. Band, S. Basconcelo, A. Bogard, G. Carter, M. Charles, P. Castro-Díez, J.H.C. Cornelissen, G. Funes, G. Jones, M. Khoshnevis, N. Pérez-Harguindeguy, M. C. Pérez-Rontomé, F. A. Shirvany, F. Vendramini, S. Yazdani, R. Abbas-Azimi, S. Boustani, M. Dehghan, J. Guerrero-Campo, A. Hynd, E. Kowsary, F. Kazemi-Saeed, B. Siavash, **P. Villar-Salvador**, R. Craigie, A. Naqinezhad, A. Romo-Díez, L. de Torres Espuny and E. Simmons. 2010. Stomatal vs. genome size in angiosperms: the somatic tail wagging the genomic dog? *Annals of Botany* 105: 573–584.

- B. Cuesta, **Villar-Salvador P.**, Puértolas J., Rey Benayas J.M. Michalet R. 2010 Facilitation of oak in Mediterranean shrubland is explained by both direct and indirect interactions mediated by herbs *Journal of Ecology* 98: 688-697
- P. Villar-Salvador, Heredia N., **Millard P.** 2010 Remobilization of acorn nitrogen for early seedling growth in the Mediterranean oak *Quercus ilex* L., grown with contrasting nutrient availability *Tree Physiology* 30: 257-263

PEER-REVIEWED PAPERS (SUBMITTED AND UNDER REVIEW)

- V. Cruz, Villar-Salvador P., Ruiz-Benito P., Ibáñez I., Rey-Benayas J.M. 2019. Temporal dynamic of shrub facilitation shapes the mixing of evergreen and deciduous oaks in Mediterranean forest recovery (submitted to *Journal of Ecology*)
- A.O. Toca, Oliet J., Villar-Salvador P., Martínez R., Jacobs D.F. 2019. Nitrogen reserves differentially affect root development in ecologically distinct pine species (submitted to *Forest Ecology and Management*).

PEER REVIEWED BOOK CHAPTERS (IN THE LAST 10 YEARS)

- J. Pemán; E. Chirino; D.F. Jacobs; J.M. Espelta; P. Martín-Gómez; R. Navarro-Cerrillo; J. Oliet; A. Vilagrosa; **P. Villar-Salvador**; E. Gil-Pelegrín. 2017. Physiological keys for natural and artificial regeneration of oaks. *Oaks Physiological Ecology. Exploring the Functional Diversity of Genus Quercus L.* 7, pp. 453 - 511. Springer, Germany. ISBN 978-3-319-69098-8
- **P. Villar-Salvador**, JL Nicolás Peragón, N. Heredia Guerrero, M. Uscola Fernández 2013. *Quercus ilex* L. *In: Producción y Manejo de Semillas y Plantas Forestales. Tomo II.* Pemán J., Navarro-Cerrillo R.M., Nicolás J.L., Prada M.A., Serrada R. (Coords.) Organismo Autónomo Parques Nacionales. Serie Forestal, Madrid, Spain pp: 226-250; ISBN: 978-84-8014-846-7.
- **P. Villar-Salvador**, M. Uscola Fernández, N. Heredia Guerrero 2013. *Quercus coccifera* L. *En: Producción y Manejo de Semillas y Plantas Forestales. Tomo II.* Pemán J., Navarro-Cerrillo R.M., Nicolás J.L., Prada M.A., Serrada R. (Coords.) Organismo Autónomo Parques Nacionales. Serie Forestal, Madrid, Spain pp: 192-205; ISBN: 978-84-8014-846-7.
- **P. Villar-Salvador**, J.A Oliet Palá, N. Heredia Guerrero, M. Uscola Fernández, P. Goikoetxea. 2013. *Quercus faginea* Lam. y *Quercus humilis* Mill. *In: Producción y Manejo de Semillas y Plantas Forestales. Tomo II.* Pemán J., Navarro-Cerrillo R.M., Nicolás J.L., Prada M.A., Serrada R. (Coords.) Organismo Autónomo Parques Nacionales. Serie Forestal, Madrid, Spain pp: 206-225; ISBN: 978-84-8014-846-7.
- **P. Villar-Salvador**, B. Cuesta. 2013 *Retama monosperma* (L.) Boiss. y *Retama sphaerocarpa* (L.) Boiss. *In: Producción y Manejo de Semillas y Plantas Forestales. Tomo II.* Pemán J., Navarro-Cerrillo R.M., Nicolás J.L., Prada M.A., Serrada R. (Coords.) Organismo Autónomo Parques Nacionales. Serie Forestal, Madrid, Spain pp: 342-353; ISBN: 978-84-8014-846-7.
- L.F. Benito Matías, **P. Villar-Salvador**, J.I. García Viñas, A. Gastón, M.A. Prada. 2012 *Juniperus communis* L. *In: Producción y Manejo de Semillas y Plantas Forestales. Tomo I.* Pemán J., Navarro-Cerrillo R.M., Nicolás J.L., Prada M.A., Serrada R. (Coords.) pp: 632-646. Organismo Autónomo Parques Nacionales. Serie Forestal, Madrid, Spain.
- L.F. Benito Matías, **P. Villar-Salvador**, J.I. García Viñas, A. Gastón, M.A. Prada. 2012. *Juniperus sabina* L. *En: Producción y Manejo de Semillas y Plantas Forestales. Tomo I.* Pemán J., Navarro-Cerrillo R.M., Nicolás J.L., Prada M.A., Serrada R. (Coords.) pp: 677-685. Organismo Autónomo Parques Nacionales. Serie Forestal, Madrid, Spain.

- **P. Villar-Salvador**, S. Soliveres y J.L. Quero 2011. Introducción de especies leñosas. *In*: F. Valladares, L. Balaguer, I. Mola, A. Escudero, V. Alfaya (Eds.). Restauración de áreas afectadas por infraestructuras de transporte. Bases científicas para soluciones técnicas. Fundación Biodiversidad. Madrid, Spain.
- **P. Villar-Salvador**, J. Puértolas, J.L. Peñuelas 2009. Assessing Morphological and Physiological Plant Quality for Mediterranean Woodland Restoration Projects. *In*: Bautista, S., Aronson, J. y Vallejo, R (Eds.). Land Restoration to Combat Desertification: Innovative Approaches, Quality Control and Project Evaluation. Pp. 103-120, Fundación Centro de Estudios Ambientales del Mediterráneo (CEAM). Valencia, Spain.

PUBLICATION QUALITY INDEXES

Published paper in journals included in the SCI: 49, 37 are in Q1

Published papers in journals not included in the SCI (mostly in Spanish): 44

Book chapters: 16

h-index (according to Google Scholar) = 27; i10-index = 39

h-index (according to Web of Science) = 21

Total citations of my published work= 3493

SYNERGISTIC ACTIVITIES AND CONFERENCES

- Associate Editor of *New Forests* (2010 to present)
- Secretary of the Department of Ecology at the University of Alcalá (2009-to 2013).
- Coordinator of the Master on Ecosystem Restoration at the University of Alcalá (2013 to present).
- Chair in the scientific committee of the symposium on Restoring Forests
- Chair in the scientific committee of the III y V Spanish Forestry Congress, held in Granada 2001 and Ávila 2009, respectively.
- Organization of the congress: I Reunión del Grupo de Trabajo de Repoblaciones Forestales de la Sociedad Española de Ciencias Forestales (SECF) y el grupo de trabajo de Restauración Ecológica de la Asociación Española de Ecología Terrestre. November 2007.
- Keynote speaker in the 1st Congress on Reforestation challenges. IUFRO-University of Belgrade, Belgrade (Serbia), June 2015. Title of conference: Restoration of the Spanish Mediterranean forests: challenges for the XXI century and lesson on plant quality and nursery cultivation.
- Keynote speaker in the 2nd Restoring Forests. IUFRO-Purdue University. Lafayette, Indiana, USA. Title of conference: Importance of stored nitrogen and carbohydrates on seedling outplanting performance.
- Keynote speaker in the Congress on Nutrient Dynamics of Planted Forests, November 2012, Vancouver, Washington USA. Title of the conference: Nursery fertilization of oaks: consequences for plant quality and out-planting”

SHORT STAYS AT RESEARCH INSTITUTIONS

- INRA, Unité Mixte de Recherche, Ecologie et Ecophysiologie Forestières. Nancy (France). February-May 2004
- Macaulay Institute, Aberdeen, (UK). June 2008
- INRA, Unité Mixte de Recherche, Ecologie et Ecophysiologie Forestières. Nancy (France). October 2010.

- Forestry and Natural Resources Department, Purdue University. West Lafayette (Indiana, USA). July 2011
- Biological and Environmental Sciences, School of Natural Sciences, University of Stirling, UK. October 2013.
- Forestry and Natural Resources Department, Purdue University. West Lafayette (Indiana, USA). August 2014
- Key Laboratory for Silviculture and Conservation, Beijing Forestry University, Beijing, China. July 2017

SCIENTIFIC SUPERVISOR:

- Supervised PhD thesis:
 - 1) Bárbara Cuesta. February 2010. Revegetation of abandoned croplands in Mediterranean continental environments. From the ecophysiology of individuals to ecosystem properties. Universidad de Alcalá (Spain).
 - 2) Mercedes Uscola July 2013. Ecophysiology of nitrogen in Mediterranean plants: strategies of nitrogen forms absorption, functional responses, and use of reserves for growth. Universidad de Alcalá (Spain).
 - 3) Laura Fernández Pérez. May 2018. Functional responses of conifers to cold and drought: a multiscale approach. Universidad de Alcalá (Spain).
 - 4) Wenhui Shi. June 2018. Effects of acorn nutrient and soil fertility on *Quercus variabilis* seedling quality and outplanting performance. Beijing Forestry University (China).
- PhD students under supervision: Andrei Toca (dissertation confirmed in February 2019), Verónica Cruz (dissertation confirmed in April 2019), Loreto Martínez (expected dissertation in early 2020), José Luis Garcia (expected dissertation in late 2020).
- Master and Undergraduate thesis: Supervisor of more than 35 students.

REFEREE IN INTERNATIONAL SCIENTIFIC JOURNALS

American Journal of Botany, Annals of Forest Science, Bosques, Canadian Journal of Forest Research, Ecological Engineering, Environmental and Experimental Botany, Forest Pathology, Forest Systems, Functional Plant Biology, Journal of Applied Ecology, Journal of Arid Environments, Journal of Vegetation Science, New Forests, Oecologia, Planta, Plant Cell and Environment, Plant Ecology, Plant Ecology and Diversity, Plant and Soil, PlosOne, Restoration Ecology, Scientific Reports, Tree and Forestry Science and Biotechnology, Tree Physiology, Web Ecology.

In Alcalá de Henares, January 23, 2019

Pedro Villar-Salvador