

Biological Mission of Galicia (CSIC)  
C/ Carballeira, 8 (Salcedo)  
E-36143 Pontevedra, Galicia, Spain  
[xmoreira1@gmail.com](mailto:xmoreira1@gmail.com)  
<http://plantherbivory.weebly.com/>

# XOAQUÍN MOREIRA TOMÉ

---

## Education

2008-2010 PhD, University of Vigo, Spain  
2006-2007 M.Sc., University of Vigo, Spain  
2001-2005 B.S. in Forestry, University of Santiago de Compostela, Spain

## Academic & Research Appointments

2021-present Senior researcher (Científico Titular), Biological Mission of Galicia (CSIC), Pontevedra, Spain  
2015-2021 Ramon y Cajal researcher, Biological Mission of Galicia (CSIC), Pontevedra, Spain  
2014-2015 Postdoctoral researcher, University of Neuchâtel, Dep. Evolutionary Entomology, Switzerland  
2012-2014 Fulbright postdoc, University of California, Dep. Ecology & Evolutionary Biology, Irvine USA  
2010-2012 Postdoctoral researcher, Biological Mission of Galicia-CSIC, Dep. Forestry, Pontevedra, Spain  
2006-2010 Predoctoral researcher, Forestry Research Centre of Lourizán, Dep. Ecology, Pontevedra, Spain

## Publications

### Peer-reviewed papers

- [111] Gaytán A, Abdelfattah A, Faticov M, **Moreira X**, Castagneyrol B, Van Halder I, De Frenne P, Meeussen C, Timmermans BGH, Ten Hoopen JPJG, Rasmussen PU, Bos N, Jaatinen R, Pulkkinen P, Söderlund S, Gotthard K, Pawlowski K, Tack AJM (2022) Changes in the foliar fungal community between oak leaf flushes along a latitudinal gradient in Europe. *Journal of Biogeography*. Impact Factor: 4.810 (41/174 Ecology) (9/48 Geography, Physical).
- [110] Vázquez-González C, Pombo-Salinas L, Martín-Cacheda L, Rasmann S, Röder G, Abdala-Roberts L, Mooney KA, **Moreira X** (2022) Effect of water availability on volatile-mediated communication between potato plants in response to insect herbivory. *Functional Ecology*. Impact Factor: 6.28 (24/174 Ecology).
- [109] Fyllas N, Chrysafi D, Avtzis D, **Moreira X** (2022) Photosynthetic and defensive responses of two Mediterranean oaks to insect leaf herbivory. *Tree Physiology*. Impact Factor: 4.561 (5/70 Forestry).
- [108] Gaytán A, **Moreira X**, Castagneyrol B, Van Halder I, De Frenne P, Meeussen C, Timmermans BGH, Ten Hoopen JPJG, Rasmussen PU, Bos N, Jaatinen R, Pulkkinen P, Söderlund S, Covelo F, Gotthard K, Tack AJM (2022) The co-existence of multiple oak leaf flushes contributes to the large within-tree variation in chemistry, insect attack and pathogen infection. *New Phytologist* 235:1615-1628. Impact Factor: 10.323 (8/239 Plant Sciences).
- [107] Castillo JM, Mancilla-Leytón JM, Martins-Noguerol R, **Moreira X**, Moreno-Pérez AJ, Muñoz-Vallés S, Pedroche J, Figueroa ME, García-González A, Salas JJ, Millán-Linares MC, Francisco M, Cambrollé J (2022) Interactive effects between salinity and nutrient deficiency on biomass production and bio-active compounds accumulation in the halophyte *Crithmum maritimum*. *Scientia Horticulturae* 301: 111136. Impact Factor: 4.342 (4/36 Horticulturae).

- [106] Valdés-Correcher E, Popova A, Galmán A, Prinzing A, Selikhovkin AV, Howe AG, Mrazova A, Dulaurent A-M, Hampe A, Tack AJM, Bouget C, Lupaştean D, Harvey D, Musolin DL, Lövei GL, Centenaro G, van Halder I, Hagge J, Dobrosavljević J, Pitkänen J-M, Koricheva J, Sam K, Barbaro L, Branco M, Ferrante M, Faticov M, Tahadlová M, Gossner M, Cauchoix M, Bogdziewicz M, Duduman M-L, Kozlov MV, Bjoern MC, Mamaev NA, Fernandez-Conradi P, Thomas RL, Wetherbee R, Green S, Milanović S, **Moreira X**, Kadiri Y, Castagnyrol B (2022) Effects of impervious surface, local tree cover, and insect feeding guild. *Ecology and Evolution* 12:e8709. Impact Factor: 3.167 (75/174 Ecology).
- [105] Martins-Noguerol R, Pérez-Ramos IM, Matías L, **Moreira X**, Francisco M, García-González A, Troncoso-Ponce MA, Thomasset B, Martínez-Force E, Moreno-Pérez AJ, Cambrollé J (2022) *Crithmum maritimum* seeds, a potential source for high-quality oil and phenolic compounds in soils with no agronomical relevance. *Journal of Food Composition and Analysis* 108:104413. Impact Factor: 4.520 (45/143 Food Science & Technology).
- [104] Abdala-Roberts L, Vázquez-González C, Rasmann S, **Moreira X** (2022) Test of communication between potato plants in response to herbivory by the Colorado potato beetle. *Agricultural and Forest Entomology* 24:212-218. Impact Factor: 2.126 (38/100 Entomology).
- [103] Reyes-Hernández M, Angulo-Pérez D, Quijano T, **Moreira X**, Parra-Tabla V, Vázquez-Bolaños M, Abdala-Roberts L (2022) An experimental test of ant effects on herbivory and pathogen infection on wild cotton (*Gossypium hirsutum* L.). *Arthropod-Plant Interactions* 6:77–86. Impact Factor: 2.409 (32/100 Entomology).
- [102] **Moreira X**, Abdala-Roberts L, Castagnyrol B, Caujapé-Castells J, Cruz-Guedes J, Lago-Núñez B, Vicens-Fornés M, García-Verdugo C (2022) A phylogenetically-controlled test does not support the prediction of lower putative anti-herbivore traits for insular woody species. *Journal of Biogeography* 49:274-285. Impact Factor: 4.810 (41/174 Ecology) (9/48 Geography, Physical).
- [101] Martins-Noguerol R, Matías L, Pérez-Ramos IM, **Moreira X**, Muñoz-Vallés S, Mancilla-Leytón JM, Francisco M, García-González A, De Andrés-Gil C, Martínez-Force E, Millán-Linares MC, Pedroche J, Figueroa ME, Moreno-Pérez AJ, Cambrollé J (2022) Differences in nutrient composition of sea fennel (*Crithmum maritimum*) grown in different habitats and optimally controlled growing conditions. *Journal of Food Composition and Analysis* 106:104266. Impact Factor: 4.520 (45/143 Food Science & Technology).
- [100] van Dijk LJA, **Moreira X**, Barr AE, Abdala-Roberts L, Castagnyrol B, Faticov M, Hardwick B, ten Hoopen JPJG, de la Mata R, Pires RM, Roslin T, Schigel DS, Timmermans BGH, Tack AJM (2022) Urbanization affects oak-pathogen interactions across spatial scales. *Ecography* 2022:e06091. Impact Factor: 6.802 (7/65 Biodiversity Conservation) (18/174 Ecology).
- [99] **Moreira X**, Abdala-Roberts L (2022) A roadmap for future research on insularity effects on plant-herbivore interactions. *Global Ecology and Biogeography* 31:602–610. Impact Factor: 6.909 (16/174 Ecology) (3/48 Geography, Physical).
- [98] **Moreira X**, Vázquez-González C, Abdala-Roberts L (2021) Proximate drivers of population inter-annual variation in seed output for a masting conifer species. *Forest Ecology and Management* 498:119562. Impact Factor: 4.384 (6/70 Forestry).
- [97] Calixto ES, Lange D, **Moreira X**, Del-Claro K (2021) Plant species-specificity of ant-plant mutualistic interactions in the Brazilian savanna: Differential predation of termites by *Camponotus crassus* on five species of extrafloral nectaried plants. *Biotropica* 53:1406–1414. Impact Factor: 2.858 (89/174 Ecology).
- [96] **Moreira X**, Pérez-Ramos IM, Matías L, Francisco M, García-González A, Martins-Noguerol R, Vázquez-González C, Abdala-Roberts L, Cambrollé J (2021) Effects of soil abiotic factors and plant chemical

defences on seed predation on sea fennel (*Crithmum maritimum*). *Plant and Soil* 465:289–300. Impact Factor: 4.993 (35/239 Plant Sciences).

- [95] **Moreira X**, Granjel RR, de la Fuente M, Fernández-Conradi P, Pasch V, Soengas P, Turlings TCJ, Vázquez-González C, Abdala-Roberts L, Rasmann S (2021) Apparent inhibition of induced plant volatiles by a fungal pathogen prevents airborne communication between potato plants. *Plant, Cell and Environment* 44:1192-1201. Impact Factor: 7.947 (31/239 Plant Sciences).
- [94] Valdés-Correcher E, **Moreira X**, Augusto L, Barbaro L, Bouget C, Bouriaud O, Branco M, Centenaro G, Csóka G, Damestoy T, Dobrosavljević J, Duduman M-L, Dulaurent A-M, Eötvös CB, Faticov M, Ferrante M, Fürjes-Mikó A, Galmán A, Gossner MM, Hampe A, Harvey D, Gordon Howe A, Kadiri Y, Kaennel-Dobbertin M, Koricheva J, Kozel A, Kozlov MV, Löveï GL, Lupăștean D, Milanović S, Mrazova A, Opgennoorth L, Pitkänen J-M, Popova A, Popović M, Prinzing A, Queloz V, Roslin T, Sallé A, Sam K, Scherer-Lorenzen M, Schuldt A, Selikhovkin A, Suominen L, Tack AJM, Tahadlova M, Thomas R, Castagneyrol B (2021) Search for top-down and bottom-up drivers of latitudinal trends in insect herbivory in oak trees in Europe. *Global Ecology and Biogeography* 30:651–665. Impact Factor: 6.909 (16/174 Ecology) (3/48 Geography, Physical).
- [93] Jactel H, **Moreira X**, Castagneyrol B (2021) Tree diversity and forest resistance to insect pests: patterns, mechanisms and prospects. *Annual Review of Entomology* 66:277-296. Impact Factor: 22.682 (1/100 Entomology).
- [92] Galmán A, Abdala-Roberts L, Wartalska P, Covelo F, Röder G, Szenteczki M, **Moreira X\***, Rasmann S\* (2021) Elevational gradients in constitutive and induced oak defences based on individual traits and their correlated expression patterns. \*Both authors share the senior authorship. *Oikos* 130:396-407. Impact Factor: 4.254 (53/174 Ecology).
- [91] Sanczuk P, Govaert S, Meeussen C, De Pauw K, Vanneste T, Depauw L, **Moreira X**, Schoelynck J, De Boevre M, De Saeger S, Bollmann K, Brunet J, Cousins SAO, Plue J, Diekmann M, Graae BJ, Hedwall P-O, Iacopetti G, Lenoir J, Orczewska A, Ponette Q, Selvi F, Spicher F, Vermeir P, Calders K, Verbeek H, Verheyen K, Vangansbeke P, De Frenne P (2021) Small scale environmental variation modulates plant defence syndromes of understorey plants in deciduous forests of Europe. *Global Ecology and Biogeography* 30:205-219. Impact Factor: 6.909 (16/174 Ecology) (3/48 Geography, Physical).
- [90] Poeydebat C, Jactel H, **Moreira X**, Koricheva J, Barsoum N, Bauhus J, Eisenhauer N, Ferlian O, Francisco M, Gottschall F, Gravel D, Mason B, Muiruri E, Muys B, Nock C, Paquette A, Ponette Q, Scherer-Lorenzen M, Stokes V, Staab M, Verheyen K, Castagneyrol B (2021) Climate affects neighbour-induced changes in leaf chemical defences and tree diversity-herbivory relationships. *Functional Ecology* 35:67-81. Impact Factor: 6.28 (24/174 Ecology).
- [89] **Moreira X**, Abdala-Roberts L, De Frenne P, Galmán A, Gaytán A, Jaatinen R, Lago-Núñez B, Meeussen C, Pulkkinen P, Rasmussen PU, ten Hoppen JPJG, Timmermans BGH, Vázquez-González C, Bos N, Castagneyrol B, Tack AJM (2021) Effects of latitude and conspecific plant density on insect leaf herbivory in oak saplings and seedlings. *American Journal of Botany* 108:172-176. Impact Factor: 3.325 (72/239 Plant Sciences).
- [88] **Moreira X**, Castagneyrol B, García-Verdugo C, Abdala-Roberts L (2021) A meta-analysis of insularity effects on herbivory and plant defences. *Journal of Biogeography* 48:386–393. Impact Factor: 4.810 (41/174 Ecology) (9/48 Geography, Physical).
- [87] Damestoy T, **Moreira X**, Jactel H, Valdés-Correcher E, Plomion C, Castagneyrol B (2021) Growth and mortality of the oak processionary moth on two oak species: direct and trait-mediated effects of host and neighbour species identity. *Entomologia Generalis* 41:13-25. Impact Factor: 6.608 (2/100 Entomology).
- [86] Calixto ES, Rodrigues Novaes L, Ferreira Borges dos Santos D, Lange D, **Moreira X**, Del-Claro K (2021) Climate seasonality drives ant-plant-herbivore interactions via plant phenology in an extrafloral nectary-

bearing plant community. *Journal of Ecology* 109:639-651. Impact Factor: 6.38 (23/174 Ecology) (21/239 Plant Sciences).

- [85] Quijano-Medina T, Turlings TCJ, Sosenski P, Grandi L, Cervera JC, **Moreira X\***, Abdala-Roberts L\* (2021) Effects of soil salinity on the expression of direct and indirect defenses in wild cotton (*Gossypium hirsutum*). \*Both authors share the senior authorship. *Journal of Ecology* 109:354–368. Impact Factor: 6.38 (23/174 Ecology) (21/239 Plant Sciences).
- [84] **Moreira X**, Abdala-Roberts L, Hidalgo-Galvez MD, Vázquez-González C, Pérez-Ramos IM (2020) Micro-climatic effects on plant phenolics at the community level in a Mediterranean savanna. *Scientific Reports* 10:14757. Impact Factor: 4.380 (17/73 Multidisciplinary Sciences).
- [83] García-Verdugo C, Monroy P, Pugnaire FI, Jura-Morawiec J, **Moreira X**, Flexas J (2020) Leaf functional traits and insular colonization: Subtropical islands as a melting pot of trait diversity in a widespread plant lineage. *Journal of Biogeography* 47: 2362–2376. Impact Factor: 4.327 (35/166 Ecology) (9/50 Geography, Physical).
- [82] Valdés-Correcher E, Bourdin A, González-Martínez SC, **Moreira X**, Galmán A, Brachi B, Hampe A, Castagneyrol B (2020) Leaf chemical defences and insect herbivory in pedunculate oak (*Quercus robur*): accounting for canopy position unravels marked genetic relatedness effects. *Annals of Botany* 126:865–872. Impact Factor: 4.357 (32/235 Plant Sciences).
- [81] **Moreira X**, Abdala-Roberts L, Galmán A, Bartlow AW, Berny-Mier y Teran JC, Carrari E, Covelo F, de la Fuente M, Ferrenberg S, Fyllas NM, Hoshika Y, Lee SR, Marquis RJ, Nakamura M, Nell CS, Pesendorfer MB, Steele MA, Vázquez-González C, Zhang S, Rasmann S (2020) Ontogenetic consistency in oak defence syndromes. *Journal of Ecology* 108:1822-1834. Impact Factor: 6.256 (15/166 Ecology) (16/235 Plant Sciences).
- [80] **Moreira X**, Abdala-Roberts L, Bruun HH, Covelo F, De Frenne P, Galmán A, Gaytán A, Jaatinen R, Pulkkinen P, ten Hoppen JPJG, Timmermans BGH, Tack AJM, Castagneyrol B (2020) Latitudinal variation in seed predation correlates with latitudinal variation in seed defensive and nutritional traits in a widespread oak species. *Annals of Botany* 125:881–890. Impact Factor: 4.357 (32/235 Plant Sciences).
- [79] **Moreira X**, Abdala-Roberts L, Nell CS, Vázquez-González C, Pratt JD, Keefover-Ring K, Mooney KA (2019) Sexual and genotypic variation in terpene quantitative and qualitative profiles in the dioecious shrub *Baccharis salicifolia*. *Scientific Reports* 9:14655. Impact Factor: 3.998 (17/72 Multidisciplinary Sciences).
- [78] Galmán A, Abdala-Roberts L, Covelo F, Rasmann S, **Moreira X** (2019) Parallel increases in insect herbivory and defenses with increasing elevation for both saplings and adult trees of oak (*Quercus*) species. *American Journal of Botany* 106:1558-1565. Impact Factor: 3.038 (48/234 Plant Sciences).
- [77] **Moreira X**, Romero-Pérez A, Luna-Chaparro E, Orona-Tamayo D, Quintana-Rodríguez E, Reyes-Chilpa R, Abdala-Roberts L, Cano-Santana Z, Hernández-Cumplido J (2019) Effects of plant sex on insect abundance across three trophic levels in the perennial shrub *Buddleja cordata*. *Entomologia, Experimentalis et Applicata* 167:950–956. Impact Factor: 1.696 (32/101 Entomology).
- [76] **Moreira X**, Vázquez-González C, Encinas-Valero M, Covelo F, Castagneyrol B, Abdala-Roberts L (2019) Greater phylogenetic distance from native oaks predicts escape from insect leaf herbivores by non-native oak saplings. *American Journal of Botany* 106:1202–1209. Impact Factor: 3.038 (48/234 Plant Sciences).
- [75] Abdala-Roberts L, Quijano-Medina T, Reyes-Hernández M, **Moreira X**, Francisco M, Angulo-Pérez D, Parra-Tabla V, Virgen A, Rojas JC (2019) Effects of amount and recurrence of herbivory on the

induction of direct and indirect defences in wild cotton. *Plant Biology* 21:1063–1071. Impact Factor: 2.167 (82/234 Plant Sciences).

- [74] Robert CAM, Pellissier L, **Moreira X**, Defosse E, Pfander M, Guyer A, van Dam NM, Rasmann S (2019). Correlated expression of phytohormones and glucosinolates shapes insect herbivore resistance of *Cardamine* species along elevational gradients. *Journal of Chemical Ecology* 45:638-648. Impact Factor: 2.117 (82/169 Ecology).
- [73] Abdala-Roberts L, Quijano-Medina T, **Moreira X**, Vázquez-González C, Parra-Tabla V, Berny Mier y Teran JC, Grandi L, Glauser G, Turlings TCJ, Benrey B (2019) Bottom-up control of geographic variation in insect herbivory on wild cotton (*Gossypium hirsutum*) by plant defenses and climate. *American Journal of Botany* 106:1059–1067. Impact Factor: 3.038 (48/234 Plant Sciences).
- [72] **Moreira X**, Castagneyrol B, de la Mata R, Fyllas NM, Galmán A, García-Verdugo C, Larrinaga AR, Abdala-Roberts L (2019) Effects of insularity on insect leaf herbivory and chemical defences in a Mediterranean oak species. *Journal of Biogeography* 46:1226–1233. Impact Factor: 3.723 (35/169 Ecology) (12/50 Geography, Physical).
- [71] **Moreira X**, Castagneyrol B, Abdala-Roberts L, Traveset A (2019) A meta-analysis of herbivore effects on plant attractiveness to pollinators. *Ecology* 100:e02707. Impact Factor: 4.7 (22/169 Ecology).
- [70] Quijano-Medina T, Covelo F, **Moreira X\***, Abdala-Roberts L\* (2019) (\*Both authors share the senior authorship). Compensation to simulated insect leaf herbivory in wild cotton (*Gossypium hirsutum*): responses to multiple levels of damage and associated traits. *Plant Biology* 21:805-812. Impact Factor: 2.167 (82/234 Plant Sciences).
- [69] Abdala-Roberts L, Pérez-Niño B, **Moreira X**, Parra-Tabla V, Grandi L, Glauser G, Benrey B, Turlings TCJ (2019) Effects of early-season insect herbivory on subsequent pathogen infection and ant abundance on wild cotton (*Gossypium hirsutum*). *Journal of Ecology* 107:1518-1529. Impact Factor: 5.76 (16/169 Ecology) (15/234 Plant Sciences).
- [68] Galmán A, Petry WK, Abdala-Roberts L, Butrón A, de la Fuente M, Francisco M, Kergunteuil A, Rasmann S, **Moreira X** (2019) Inducibility of chemical defences in young oak trees is stronger in species with high elevational ranges. *Tree Physiology* 39:606-614. Impact Factor: 3.655 (4/68 Forestry).
- [67] Damestoy T, Brachi B, **Moreira X**, Jactel H, Plomion C, Castagneyrol B (2019) Oak genotype and phenolic compounds differently affect the performance of two insect herbivores with contrasting diet breadth. *Tree Physiology* 39:615–627. Impact Factor: 3.655 (4/68 Forestry).
- [66] **Moreira X**, Abdala-Roberts L (2019) Specificity and context-dependency of plant-plant communication in response to insect herbivory. *Current Opinion in Insect Science* 32:15-21. Impact Factor: 4.565 (3/101 Entomology) (24/169 Ecology).
- [65] **Moreira X**, Abdala-Roberts L, Pérez-Ramos IM, Knops JMH, Pesendorfer MB, Koenig WD, Mooney KA (2019) Weather cues associated with masting behavior dampen the negative autocorrelation between past and current reproduction in oaks. *American Journal of Botany* 106:51-60. Impact Factor: 3.038 (48/234 Plant Sciences).
- [64] **Moreira X**, Abdala-Roberts L, Berny Mier y Teran JC, Covelo F, de la Mata R, Francisco M, Hardwick B, Pires RM, Roslin T, Schigel DS, ten Hoppen JPJG, Timmermans BGH, van Dijk LJA, Castagneyrol B, Tack AJM (2019) Impacts of urbanization on insect herbivory and plant defences in oak trees. *Oikos* 128:113-123. Impact Factor: 3.37 (41/169 Ecology).
- [63] **Moreira X**, Galmán A, Francisco M, Castagneyrol B, Abdala-Roberts L (2018) Host plant frequency and secondary metabolites are concurrently associated with insect herbivory in a dominant riparian tree. *Biology Letters* 14: 20180281. Impact Factor: 3.323 (17/87 Biology).

- [62] **Moreira X**, Nell CS, Meza-Lopez MM, Rasmann S, Mooney KA (2018) Specificity of plant-plant communication for *Baccharis salicifolia* sexes but not genotypes. *Ecology* 99:2731-2739. Impact Factor: 4.285 (27/164 Ecology).
- [61] **Moreira X**, Abdala-Roberts L, Gols R, Francisco M (2018) Plant domestication decreases both constitutive and induced chemical defences by direct selection against defensive traits. *Scientific Reports* 8:12678. Impact Factor: 4.011 (15/69 Multidisciplinary Sciences).
- [60] Abdala-Roberts L, Galmán A, Petry WK, Covelo F, de la Fuente M, Glauser G, **Moreira X** (2018) Interspecific variation in leaf functional and defensive traits in oak species and its underlying climatic drivers. *PLoS ONE* 13:e0202548. Impact Factor: 2.766 (24/69 Multidisciplinary Sciences).
- [59] **Moreira X**, Abdala-Roberts L, Galmán A, Francisco M, de la Fuente M, Butrón A, Rasmann S (2018) Assessing the influence of biogeographical region and phylogenetic history on chemical defences and herbivory in *Quercus* species. *Phytochemistry* 153:64-73. Impact Factor: 2.905 (52/228 Plant Sciences).
- [58] Rosado-Sánchez S, Parra-Tabla V, Betancur-Ancona D, **Moreira X**, Abdala-Roberts L (2018) Effects of tree species diversity on insect herbivory and leaf defenses in *Cordia dodecandra*. *Ecological Entomology* 43:703-711. Impact Factor: 2.073 (20/98 Entomology).
- [57] **Moreira X**, Abdala-Roberts L, Castagneyrol B (2018) Interactions between plant defence signaling pathways: Evidence from bioassays with insect herbivores and plant pathogens. *Journal of Ecology* 106: 2353–2364. Impact Factor: 5.68 (16/164 Ecology) (12/228 Plant Sciences).
- [56] Castagneyrol B, **Moreira X**, Jactel H (2018) Drought and plant neighborhood interactively determine herbivore consumption and performance. *Scientific Reports* 8:5930. Impact Factor: 4.011 (15/69 Multidisciplinary Sciences).
- [55] Abdala-Roberts L, Covelo F, Parra-Tabla V, Berny-Mier y Terán JC, Mooney KA, **Moreira X** (2018) Intra-specific latitudinal clines in leaf carbon, nitrogen and phosphorus and their underlying abiotic correlates in *Ruellia nudiflora*. *Scientific Reports* 8:596. Impact Factor: 4.011 (15/69 Multidisciplinary Sciences).
- [54] Castagneyrol B, Jactel H, **Moreira X** (2018) Anti-herbivore defences and insect herbivory: interactive effects of drought and neighbours. *Journal of Ecology* 106:2043-2057. Impact Factor: 5.68 (16/164 Ecology) (12/228 Plant Sciences).
- [53] Rosado-Sánchez S, Parra-Tabla V, Betancur-Ancona D, **Moreira X**, Abdala-Roberts L (2018) Tree species diversity alters investment in plant chemical defenses at an experimental forest plantation in Southern Mexico. *Biotropica* 50:246-253. Impact Factor: 2.989 (50/164 Ecology).
- [52] **Moreira X**, Petry WK, Mooney KA, Rasmann S, Abdala-Roberts L (2018) Elevational gradients in plant defences and insect herbivory: recent advances in the field and prospects for future research. *Ecography* 41:1485-1496. Impact Factor: 5.946 (4/58 Biodiversity Conservation) (12/164 Ecology).
- [51] Nell CS, Meza-Lopez MM, Croy JR, Nelson AS, **Moreira X**, Pratt JD, Mooney KA (2018) Relative effects of genetic variation and sexual dimorphism on plant traits and associated arthropod communities. *Oecologia* 187:389-400. Impact Factor: 2.915 (52/164 Ecology).
- [50] **Moreira X**, Castagneyrol B, Abdala-Roberts L, Berny-Mier y Terán JC, Timmermans BGH, Bruun HH, Covelo F, Glauser G, Rasmann S, Tack AJM (2018) Latitudinal variation in plant chemical defenses drives latitudinal patterns of leaf herbivory. *Ecography* 41:1124-1134. Impact Factor: 5.946 (4/58 Biodiversity Conservation) (12/164 Ecology).

- [49] **Moreira X**, Nell CS, Katsanis A, Rasmann S, Mooney KA (2018) Herbivore specificity and the chemical basis of plant-plant communication in *Baccharis salicifolia* (Asteraceae). *New Phytologist* 220:703-713. Impact Factor: 7.299 (8/228 Plant Sciences).
- [48] Galmán A, Abdala-Roberts L, Zhang S, Berny-Mier y Terán JC, Rasmann S, **Moreira X** (2018) A global analysis of elevational gradients in leaf herbivory and its underlying drivers: effects of plant growth form, leaf habit, and climatic correlates. *Journal of Ecology* 106:413-421. Impact Factor: 5.68 (16/164 Ecology) (12/228 Plant Sciences).
- [47] **Moreira X**, Glauser G, Abdala-Roberts L (2017) Interactive effects of plant neighbourhood and ontogeny on insect herbivory and plant defensive traits. *Scientific Reports* 7:4047. Impact Factor: 4.122 (12/64 Multidisciplinary Sciences).
- [46] **Moreira X**, Pérez-Ramos IM, Abdala-Roberts L, Mooney KA (2017) Functional responses of contrasting seed predator guilds to masting in two Mediterranean oak species. *Oikos* 126:1042-1050. Impact Factor: 3.709 (37/160 Ecology).
- [45] **Moreira X**, Pearse IS (2017) Leaf habit does not determine the investment in both physical and chemical defences and pair-wise correlations between these defensive traits. *Plant Biology* 19:354-359. Impact Factor: 2.156 (70/222 Plant Sciences).
- [44] Abdala-Roberts L, Parra-Tabla V, **Moreira X**, Ramos-Zapata J (2017) Ecological and evolutionary consequences of tri-trophic interactions: spatial variation and effects of plant density. *American Journal of Botany* 104:241-251. Impact Factor: 2.788 (49/222 Plant Sciences).
- [43] Abdala-Roberts L, Rasmann S, Berny-Mier y Terán JC, Covelo F, Glauser G, **Moreira X** (2016) Biotic and abiotic factors associated with altitudinal variation in plant traits and herbivory in a dominant oak species. *American Journal of Botany* 103:2070-2078. Impact Factor: 3.05 (39/212 Plant Sciences).
- [42] **Moreira X**, Abdala-Roberts L, Zas R, Merlo E, Lombardero MJ, Sampedro L, Mooney KA (2016) Masting behaviour in a Mediterranean pine tree alters seed predator selection on reproductive output. *Plant Biology* 18:973-980. Impact Factor: 2.106 (65/211 Plant Sciences).
- [41] Abdala-Roberts L, Hernández-Cumplido J, Chel-Guerrero L, Betancur-Ancona D, Benrey B, **Moreira X** (2016) Effects of plant intra-specific diversity across three trophic levels: underlying mechanisms and plant traits. *American Journal of Botany* 103:1810-1818. Impact Factor: 3.05 (39/212 Plant Sciences).
- [40] **Moreira X**, Sampedro L, Zas R, Pearse IS (2016) Defensive traits in young pine trees cluster into two divergent syndromes related to early growth rate. *PLoS ONE* 11: e0152537. Impact Factor: 2.806 (8/56 Multidisciplinary Sciences).
- [39] Pellissier L\*, **Moreira X\***, Danner H\*, Serrano M\*, Salamin N, van Dam N, Rasmann S (2016) (\*same contribution of these authors) The simultaneous inducibility of phytochemicals related to plant direct and indirect defences against herbivores is stronger at low elevation. *Journal of Ecology* 104:1116-1125. Impact Factor: 5.813 (11/153 Ecology).
- [38] Abdala-Roberts L, **Moreira X**, Rasmann S, Parra-Tabla V, Mooney KA (2016) Test of biotic and abiotic correlates of latitudinal variation in defenses in the perennial herb *Ruellia nudiflora*. *Journal of Ecology* 104:580-590. Impact Factor: 5.813 (11/153 Ecology).
- [37] **Moreira X**, Abdala-Roberts L, Rasmann S, Castagneyrol B, Mooney KA (2016) Plant diversity effects on insect herbivores and their natural enemies: current thinking, recent findings, and future directions. *Current Opinion in Insect Science* 14:1-7. Impact Factor: 3.66 (8/94 Entomology) (20/86 Biology).
- [36] **Moreira X**, Petry WK, Hernández-Cumplido J, Morelon S, Benrey B (2016) Plant defence responses to volatile alert signals are population-specific. *Oikos* 125:950-956. Impact Factor: 4.03 (32/153 Ecology).

- [35] Hernández-Cumplido J, Forter B, **Moreira X**, Heil M, Benrey B (2016) Induced floral and extrafloral nectar production affect ant-pollinator interactions and plant fitness. *Biotropica* 48:342-348. Impact Factor: 1.73 (84/153 Ecology).
- [34] Abdala-Roberts L, González-Moreno A, Mooney KA, **Moreira X**, González-Hernández A, Parra-Tabla V (2016) Effects of tree species and genotypic diversity on leafminer-parasitoid interactions. *Agricultural and Forest Entomology* 18:43-51. Impact Factor: 1.726 (23/91 Entomology).
- [33] Abdala-Roberts L, Berny-Mier y Terán JC, **Moreira X**, Durán-Yañez A, Tut-Pech F (2015) Effects of pepper (*Capsicum chinense*) genotypic diversity on two insect herbivores and mechanisms underlying plant-herbivore interactions. *Agricultural and Forest Entomology* 17:433-438. Impact Factor: 1.805 (19/94 Entomology).
- [32] **Moreira X**, Abdala-Roberts L, Hernández-Cumplido J, Cuny MAC, Glauser G, Benrey B (2015) Specificity of induced defenses, growth, and reproduction in lima bean (*Phaseolus lunatus*, Fabaceae) in response to multispecies herbivory. *American Journal of Botany* 102:1300-1308. Impact Factor: 2.811 (43/209 Plant Sciences).
- [31] **Moreira X**, Abdala-Roberts L, Linhart YB, Mooney KA (2015) Effects of climate on reproductive investment in a masting species: assessment of climatic predictors and underlying mechanisms. *Journal of Ecology* 103:1317-1324. Impact Factor: 6.180 (9/149 Ecology).
- [30] **Moreira X**, Abdala-Roberts L, Hernández-Cumplido J, Rasmann S, Kenyon SG, Benrey B (2015) Plant species variation in bottom-up effects across three trophic levels: A test of traits and mechanisms. *Ecological Entomology* 40:676-686. Impact Factor: 1.687 (23/94 Entomology).
- [29] Zas R, **Moreira X**, Ramos M, Lima MRM, Nunes da Silva M, Solla A, Vasconcelos MW, Sampedro L (2015) Intraspecific variation of anatomical and chemical defensive traits in Maritime pine (*Pinus pinaster*) as factors in susceptibility to the pinewood nematode (*Bursaphelenchus xylophilus*). *Trees, Structure and Function* 29:663-673. Impact Factor: 1.706 (16/68 Forestry).
- [28] **Moreira X**, Abdala-Roberts L, Parra-Tabla V, Mooney KA (2015) Latitudinal variation in herbivory: Influences of climatic drivers, herbivore identity, and natural enemies. *Oikos* 124:1444-1452. Impact Factor: 3.586 (34/149 Ecology).
- [27] **Moreira X**, Zas R, Solla A, Sampedro L (2015) Differentiation of persistent anatomical defensive structures is costly and determined by nutrient availability and genetic growth-defence constraints. *Tree Physiology* 35:112-123. Impact Factor: 3.587 (2/68 Forestry).
- [26] Carrillo-Gavilán A\*, **Moreira X\***, Zas R, González-Voyer A, Vila M, Sampedro L (2015) (\*same contribution both authors) Phylogenetic and biogeographical patterns in the allocation to chemical defence and defensive strategies in Palearctic and Nearctic pine trees (Subgenus *Pinus*). *Journal of Biogeography* 42:684-693. Impact Factor: 3.997 (26/149 Ecology) (5/49 Geography Physical).
- [25] **Moreira X**, Abdala-Roberts L, Parra-Tabla V, Mooney KA (2014) Positive effects of plant genotypic and species diversity on anti-herbivore defences in a tropical tree species. *PLoS ONE* 9:e105438. Impact Factor: 3.234 (8/56 Multidisciplinary Sciences).
- [24] Abdala-Roberts L, **Moreira X**, Cervera JC, Parra-Tabla V (2014) Light availability influences growth-defense trade-offs in big-leaf mahogany (*Swietenia macrophylla* King). *Biotropica* 46:591-597. Impact Factor: 2.084 (65/144 Ecology).
- [23] **Moreira X**, Mooney KA, Rasmann S, Petry WK, Carrillo-Gavilán A, Zas R, Sampedro L (2014) Trade-offs between constitutive and induced defences drive geographical and climatic clines in pine chemical defences. *Ecology Letters* 17:537-546. Impact Factor: 10.689 (2/144 Ecology).



- [22] Linhart YB, **Moreira X**, Snyder MA, Mooney KA (2014) Variability in seed cone production and functional response of seed predators to seed cone availability: support for the predator satiation hypothesis. *Journal of Ecology* 102:576-583. Impact Factor: 5.521 (12/144 Ecology).
- [21] **Moreira X**, Abdala-Roberts L, Linhart YB, Mooney KA (2014) Masting promotes individual- and population-level reproduction by increasing pollination efficiency. *Ecology* 95:801–807. Impact Factor: 4.656 (17/144 Ecology).
- [20] **Moreira X**, Lundborg L, Zas R, Carrillo-Gavilán A, Borg-Karlsson AK, Sampedro L (2013) Tissue-specific induction of pine defences: herbivore feeding guild influences differentially phloem and needle induced terpenoids. *Phytochemistry* 94:113-122. Impact Factor: 3.35 (32/195 Plant Sciences).
- [19] **Moreira X**, Mooney KA (2013) Influence of plant genetic diversity on interactions between higher trophic levels. *Biology Letters* 9:20130133. Impact Factor: 3.425 (15/83 Biology).
- [18] **Moreira X**, Zas R, Sampedro L (2013) Additive genetic variation in resistance traits of an exotic pine species: little evidence for constraints on evolution of resistance against native herbivores. *Heredity* 110:449-456. Impact Factor: 3.804 (28/140 Ecology).
- [17] **Moreira X**, Mooney KA, Zas R, Sampedro L (2012) Bottom-up effects of host-plant species diversity and top-down effects of ants interactively increase plant performance. *Proceedings of the Royal Society B* 279:4464-4472. Impact Factor: 5.683 (8/83 Biology).
- [16] **Moreira X**, Zas R, Sampedro L (2012) Differential allocation of constitutive and induced chemical defences in pine tree juveniles: a test of the optimal defence theory. *PLoS ONE* 7:e34006. Impact Factor: 3.73 (7/56 Multidisciplinary Sciences).
- [15] **Moreira X**, Zas R, Sampedro L (2012) Genetic variation and phenotypic plasticity of nutrient re-allocation and increased fine root production as putative tolerance mechanisms inducible by methyl-jasmonate in pine trees. *Journal of Ecology* 100:810-820. Impact Factor: 5.431 (14/136 Ecology).
- [14] **Moreira X**, Zas R, Sampedro L (2012) Quantitative comparison of chemical, biological and mechanical induction of secondary compounds in *Pinus pinaster* seedlings. *Trees, Structure and Function* 26:677-683. Impact Factor: 1.925 (10/62 Forestry).
- [13] **Moreira X**, Alfaro RI, King JN (2012) Constitutive defenses and damage in Sitka spruce progeny obtained from crosses between white pine weevil resistant and susceptible parents. *Forestry* 85:87-97. Impact Factor: 1.677 (12/62 Forestry).
- [12] Blanch JS, Sampedro L, Llusà J, **Moreira X**, Zas R, Peñuelas J (2012) Effects of phosphorus availability and genetic variation of leaf terpene contents and emission rates in *Pinus pinaster* seedlings susceptible and resistant to the pine weevil *Hylobius abietis*. *Plant Biology* 25:66-72. Impact Factor: 2.32 (56/195 Plant Sciences).
- [11] Carrillo-Gavilán A, **Moreira X**, Zas R, Vila M, Sampedro L (2012) Early resistance of alien and native pines against two native generalist insect herbivores: no support for the Natural Enemy Hypothesis. *Functional Ecology* 26:283-293. Impact Factor: 4.861 (19/136 Ecology).
- [10] Zas R, **Moreira X**, Sampedro L (2011) Tolerance and induced resistance in a native and an exotic pine species: relevant traits for invasion ecology. *Journal of Ecology* 99:1316-1326. Impact Factor: 5.044 (17/134 Ecology).
- [9] Sampedro L\*, **Moreira X\***, Zas R (2011) \*same contribution of both authors. Costs of constitutive and herbivore-induced chemical defenses in pine trees emerge only under low resources availability. *Journal of Ecology* 99:818-827. Impact Factor: 5.044 (17/134 Ecology).

- [8] Sampedro L, **Moreira X**, Zas R (2011) Resistance and response of *Pinus pinaster* seedlings to *Hylobius abietis* after induction with methyl jasmonate. *Plant Ecology* 212:397-401. Impact Factor: 1.829 (8/59 Forestry).
- [7] Sampedro L\*, **Moreira X\***, Llusà J, Peñuelas J, Zas R (2010) \*same contribution of both authors. Genetics, phosphorus availability and herbivore-derived induction as sources of phenotypic variation of leaf volatile terpenes in a pine species. *Journal of Experimental Botany* 61:4437-4447. Impact Factor: 4.818 (12/188 Plant Sciences).
- [6] Martíns P, Sampedro L, **Moreira X**, Zas R (2009) Nutritional status and genetic control of phenotypic plasticity to nutrient availability in *Pinus pinaster*. A multisite field study in NW Spain. *Forest Ecology and Management* 258:1429-1436. Impact Factor: 1.95 (5/46 Forestry).
- [5] Sampedro L\*, **Moreira X\***, Martíns P, Zas R (2009) \* same contribution of both authors. Growth and nutritional response of *Pinus pinaster* after a large pine weevil (*Hylobius abietis*) attack. *Trees, Structure and Function* 23:1189-1197. Impact Factor: 1.603 (9/46 Forestry).
- [4] **Moreira X**, Sampedro L, Zas R (2009) Defensive responses of *Pinus pinaster* seedlings to exogenous application of methyl-jasmonate: Concentration effect and systemic response. *Environmental and Experimental Botany* 67:94-100. Impact Factor: 3.164 (22/173 Plant Sciences).
- [3] **Moreira X**, Costas R, Sampedro L, Zas R (2008) A simple method for trapping *Hylobius abietis* (L.) alive in northern Spain. *Investigación Agraria. Sistemas y Recursos Forestales* 17:188-192. Impact Factor: 0.56 (32/46 Forestry)
- [2] **Moreira X**, Sampedro L, Zas R, Solla A (2008) Alterations of the resin canal system of *Pinus pinaster* seedlings after fertilization of a healthy and of a *Hylobius abietis* attacked stand. *Trees, Structure and Function* 22:771-777. Impact Factor: 1.629 (8/39 Forestry).
- [1] Zas R, Sampedro L, **Moreira X**, Martins P (2008) Effect of fertilization and genetic variation on susceptibility of *Pinus radiata* seedlings to *Hylobius abietis* damage. *Canadian Journal of Forest Research* 38:63–72. Impact Factor: 1.43 (13/39 Forestry).

### Book chapters

- [3] **Moreira X**, Abdala-Roberts L. Sources of variation in defensive traits in *Quercus* species: insights gained from research spanning individuals to communities and local- to broad-scale factors (2020) In: Merillon JM, Ramawat KG (eds) *Plant defence: Biological control*. Progress in Biological Control, second edition, vol. 22, 81-97. Springer Netherlands.
- [2] Carmona D, **Moreira X**, Abdala-Roberts L (2020) Latitudinal and elevational gradients in plant defences and herbivory in temperate trees: recent findings, underlying factors, and an evolutionary perspective using genomic tools. In: Núñez-Farfán J, Valverde P (eds) *Evolutionary ecology of plant-herbivore interaction*. Springer Nature Switzerland, 343-368.
- [1] **Moreira X**, Zas R, Sampedro L. Methyl jasmonate as chemical elicitor of induced responses and anti-herbivory resistance in young conifer trees (2012) In: Merillon JM, Ramawat KG (eds) *Plant defence: Biological control*. Progress in Biological Control, first edition, Volume 12, 345-362. Springer Netherlands.

## Research Grants

### Principal Investigator

2022-2024 LINGLOBAL (CSIC) (Ref: INCGL20004): “Effects of global change drivers on Latin-American tropical dry forests: integrating research perspectives towards a more robust understanding and mitigation of impacts” (PI: Xoaquín Moreira, Luis Abdala-Roberts, Rubens M. Santos; €30,000).

2022-2023 i-COOP+ (CSIC) (Ref: COOPA20477): “Investigating plant-plant signaling via volatile organic compounds as a tool for sustainable management of cotton plantations in Mexico” (PI: Xoaquín Moreira, Luis Abdala-Roberts; €24,000).

2019-2022 Spanish Ministry of Science, Innovation and Universities (Ref: RTI2018-099322-B-I00): “Use of plant-plant communication through volatile organic compounds as a strategy for biological control of pests and diseases in potato plants” (PI: Xoaquín Moreira; €84,700).

2018-2019 i-LINK+ (CSIC) (Ref: I-LINK1221): “Unravelling the mechanisms behind elevational gradients in plant-herbivore interactions” (PI: Xoaquín Moreira, Arndt Hampe; €10,200).

2016-2020 Galician Innovation Agency (Ref: IN607D2016/001): “Factors influencing the direction and magnitude of altitudinal gradients in oak defensive strategies and herbivory” (PI: Xoaquín Moreira €100,000).

2016-2018 Spanish Ministry of Economy and Competition (Ref: AGL2015-70748-R): “Factors determining the existence of defense syndromes in *Quercus* sps. in the Iberian Peninsula: consequences for the conservation of endangered species” (PI: Xoaquín Moreira €42,350).

2016-2017 i-COOP+ (CSIC) (Ref: COOPB20158): “Mechanisms explaining tree species diversity effects on associated arthropod communities: patterns of insect herbivore dispersal and expression of plant chemical defenses” (PI: Xoaquín Moreira, Luis Abdala-Roberts; €7,250).

2013-2014 UC-MEXUS-CONACyT (Ref: UCM-55592): “Integrating predators to current theory of plant anti-herbivore defenses” (PI: Kailen Mooney, Víctor Parra-Tabla, Xoaquín Moreira, Luis Abdala-Roberts; \$25,000).

2013 UC-MEXUS-CONACyT (Ref: UCM-101443): “Plant genotype diversity effects on anti-herbivore defenses” (PI: Xoaquín Moreira; \$1,500).

2012 Spanish Association of Terrestrial Ecology: “Consequences of host-plant specific diversity on the ant-aphid mutualism and the structure of arthropod community” (PI: Xoaquín Moreira; €2,000).

### Participant

2021-2025 Galician Innovation Agency (Ref: IN607A): “Sustainability and Productivity of Agroforestry Crops” (PI: Elena Cartea; €332,000; Participant: Xoaquín Moreira; €47,429).

2020-2022 BNP Paribas Foundation: “Tree Bodyguards” (PI: Bastien Castagneyrol; €235,000; Participant: Xoaquín Moreira; €7,500).

2016-2019 Consejo Nacional de Ciencia y Tecnología (CONACyT) (Ref: 250925): “Evaluation of the ecological role of defensive compounds in trees and insectivorous birds in a mixed forest plantation” (PI: Víctor Parra-Tabla, Luis Abdala-Roberts; €80,000).

2013-2015 Spanish Ministry of Economy and Competition (Ref: AGL2012-40151): “Tolerance and resistance against herbivores as driver of life history traits in Mediterranean pine species” (PI: Rafael Zas; €150,000).

2012-2013 European Union-Spanish Ministry of Science and Innovation (Integrative Action Spain-Portugal) (Ref: PRI-AIBPT-2011-1152): “Exploring new aspects of pine resistance to the Pine Nematode Wilt Disease (*Bursaphelenchus xylophilus*): intra-specific genetic variation and role of induced defences” (PI: Rafael Zas; €5,990).

2011-2012 Spanish Ministry of Education and Science (Ref: AGL2010-18724): “Trade-offs between growth and constitutive and induced resistance in the genus *Pinus*: Within and across species variation and implications for breeding programs” (PI: Rafael Zas; €131,890).

2011-2013 Galician Ministry of Education (Ref: 10MRU29107PR): “Patterns of *Pinus pinaster* and *P. radiata* resistance against forest pests: Insights from forest management in a changeable climate” (PI: María José Lombardero; €68,000).

2008-2010 Spanish Ministry of Science and Innovation (Ref: RTA2007-00100-C02-00): “Maternal effects in *Pinus pinaster*: effect of nutritional and sanitary status of mother trees in the vigour and herbivore resistance of progeny. Insights from tree breeding programs” (PI: Rafael Zas; €88,228).

2005-2007 Spanish Ministry of Science and Innovation (Ref: RTA2005-00173-00-00): “Phosphorus use efficiency in fast-growing conifers as alternative to fertilization: Genetic variation, tree breeding and phytosanitary repercussions” (PI: Rafael Zas; €69,350).

## National and International meetings

### Oral presentations

- Valdés-Correcher E, Galmán A, Hampe A, Bourdin A, Castagneyrol B, González-Martínez SC, **Moreira X** (2022) Herbivory in novel native oak stands: Disentangling the effects of landscape context, leaf defences and tree genotype. XXVI International Congress of Entomology. Helsinki (Finland)
- Moreira X**, García-Verdugo C, Castagneyrol B, Abdala-Roberts L (2021) Insularity effects on plant-herbivore interactions. ESA 2021 Annual Meeting. Denver (CO, United States of America)
- García-Verdugo C, **Moreira X**, Illera JC (2021) Biogeografía funcional en sistemas insulares: una oportunidad para abordar patrones de biodiversidad complejos. XV Congreso Nacional de la AEET. Plasencia (Spain)
- Matías L, Homet P, **Moreira X**, Pérez-Ramos IM, Godoy O, Gómez-Aparicio L (2021) Carbon allocation strategies to cope with different global change drivers in Mediterranean trees. XV Congreso Nacional de la AEET. Plasencia (Spain)
- García-Verdugo C, **Moreira X** (2019) Loss of defenses on island plants: from theory to evidence. Island Biology Meeting. University of La Réunion in Saint-Denis. Isla Reunión (France)
- Abdala-Roberts L, Quijano-Medina T, **Moreira X** (2019) Factores bióticos y abióticos asociados a variación geográfica en herbivoría por insectos en algodón silvestre (*Gossypium hirsutum*). VII Congreso Mexicano de Ecología. Querétaro (México)
- Castagneyrol B, Jactel H, **Moreira X** (2018) Interactive effects of climate and plant neighbors on phytochemistry: Do herbivores care? 103<sup>rd</sup> ESA Annual Meeting. New Orleans (LO, United States of America)
- Poeydebat C, Jactel H, **Moreira X**, Koricheva J, Barsoum N, Bauhus J, Eisenhauer N, Ferlian O, Francisco M, Gottschall F, Gravel D, Mason B, Muiruri E, Muys B, Nock C, Paquette A, Ponette Q, Scherer-Lorenzen M, Stokes V, Staab M, Verheyen K, Castagneyrol B (2018) Insect herbivory on trees: untying the effects of tree diversity, leaf traits and climate. International Conference on Ecological Sciences – Sfécologie. Rennes (France)
- Damestoy T, Brachi B, **Moreira X**, Jactel H, Plomion C, Castagneyrol B (2018) Oak genotype and chemical defences as drivers of the performance of two insect herbivores. International Conference on Ecological Sciences – Sfécologie. Rennes (France)
- Rosado-Sánchez S, Abdala-Roberts L, Parra-Tabla V, Betancur-Ancona D, **Moreira X** (2017) Effects of tree species diversity on insect herbivory and leaf defences in *Cordia dodecandra*. 54<sup>th</sup> Annual Meeting of the Association for Tropical Biology and Conservation. “Ecological and social dimensions of tropical biodiversity conservation”. Mérida (Mexico)

- Sampedro L, **Moreira X**, Zas R (2015) General patterns of early within plant allocation of chemical defences and defensive strategies in Palearctic and Nearctic pines (subgenus *Pinus*). 5<sup>th</sup> International Workshop on the Genetics of Tree-Parasite Interactions. Orleans (France)
- Quijano-Medina T, **Moreira X**, Benrey B (2015) El efecto de la domesticación en semillas de frijol Lima y su capacidad de ser atractivas a brúquidos y sus parasitoides. V Congreso Mexicano de Ecología. San Luis Potosí (Mexico)
- Mooney KA, Petry WK, Abdala-Roberts L, **Moreira X** (2012) Consequences of monarch damage and plant genotype for ant-aphid interactions on the common milkweed *Asclepias syriaca*. ESA Annual Meeting. Portland (Oregon, USA)
- Lundborg L, **Moreira X**, Zas R, Sampedro L, Björklund N, Hellqvist C, Nordlander G, Borg-Karlson A-K (2012) Chemical analysis of methyl jasmonate treated Scots pine *Pinus sylvestris* using GC-MS and LC-MS. 28<sup>th</sup> Annual Meeting of the International Society of Chemical Ecology. Vilnius (Lithuania)
- Solla A, Vivas M, Cubera E, Sampedro L, **Moreira X**, Merlo E, de la Mata R, Zas R (2011) Cross-resistance against diseases and insects in a breeding population of *Pinus pinaster*. Fourth International Workshop on the Genetics of Host-Parasite Interactions in Forestry. Oregon (United States of America)
- Zas R, Solla A, **Moreira X**, Sampedro L (2011) The potential of breeding for enhanced inducibility in *Pinus pinaster* and *Pinus radiata*. Fourth International Workshop on the Genetics of Host-Parasite Interactions in Forestry. Oregon (United States of America)
- Sampedro L, **Moreira X**, Zas R (2011) Trade-offs between induced and constitutive resistance in two pine species: secondary chemistry, effective antiherbivore-resistance and effect of nutrient availability. Fourth International Workshop on the Genetics of Host-Parasite Interactions in Forestry. Oregon (United States of America)
- Sampedro L, **Moreira X**, Zas R (2011) Crecer o defenderse: un conflicto permanente en pinos. Bosques del Futuro. Maceda (Spain)
- Zas R, Solla A, Vivas M, Cubera E, **Moreira X**, Merlo E, Lombardero MJ, de la Mata R, Sampedro L (2011) Atacados por todos los flancos: defensas cruzadas de los pinos frente a sus múltiples enemigos. Bosques del Futuro. Maceda (Spain)
- Sampedro L, **Moreira X**, Zas R (2009) Pine tree chemical defensive strategies and the evolutionary trade-off between induced and constitutive defenses. IOBC Working Group “Induced resistance in plants against insects and diseases“. Granada (Spain)
- Sampedro L, **Moreira X**, Martíns M, Zas R (2008) Experimental evidences of a genetic trade-off between induce and constitutive defenses in a pine species: secondary chemistry and effectiveness on the realized damage. The evolutionary ecology of plant-animal interactions: from genes to communities (Symposium of the Spanish Association of Terrestrial Ecology). Mallorca (Spain)
- Moreira X**, Ramos MA, Sampedro L, Zas R, Solla A (2007) Densidad y disposición de canales resiníferos en *Pinus pinaster* ante tratamientos de fertilización y el ataque de *Hylobius abietis* (Coleoptera:Curculionidae). I Reunión Científica del Grupo de Trabajo de Sanidad Forestal de la Sociedad Española de Ciencias Forestales. Palencia (Spain)
- Martíns M, **Moreira X**, Zas R, Sampedro L, Solla A (2007) Variación genética y efecto de la fertilización en la susceptibilidad de *Pinus pinaster* a *Fusarium oxysporum*. I Reunión Científica del Grupo de Trabajo de Sanidad Forestal de la Sociedad Española de Ciencias Forestales. Palencia (Spain)

### Posters

- Martins-Noguerol R, Matías L, Pérez-Ramos IM, **Moreira X**, Moreno-Pérez AJ, Pedroche J, De Andrés-Gil C, Francisco M, García-González A, Millán-Linares MC, Millán F, Cambrollé J (2021) Efecto de la variabilidad de las propiedades físico-químicas del suelo en el rendimiento de la halófito costera *Crithmum maritimum* L. XV Congreso Nacional de la AEET. Plasencia (Spain)
- Quijano-Medina T, Turlings TCJ, Francisco M, Ramos-Zapata J, **Moreira X**, Abdala-Roberts L (2021) Aphid and caterpillar feeding drive similar levels of induced defences and resistance in wild cotton. SIP21–17<sup>th</sup> Symposium on Insect-Plant Interactions. Leiden (The Netherlands).
- Galmán A, Abdala-Roberts L, Wartalska P, Covelo F, Röder G, Szenteczki M, **Moreira X**, Rasmann S (2021) Elevational gradients in constitutive and induced oak defences based on individual traits and their

- correlated expression patterns. SIP21–17<sup>th</sup> Symposium on Insect-Plant Interactions. Leiden (The Netherlands).
- Martín-Cacheda L, Vázquez-González C, Abdala-Roberts L, **Moreira X** (2021) Plant-to-plant communication in response to insect herbivory is not specific to genetic relatedness between emitter and receiver *Solanum tuberosum* plants. SIP21–17<sup>th</sup> Symposium on Insect-Plant Interactions. Leiden (The Netherlands).
- Galmán A, Petry WK, Abdala-Roberts L, Butrón A, de la Fuente M, Francisco M, Kergunteuil A, Rasmann S, **Moreira X** (2019) The simultaneous expression of constitutive chemical defences and their inducibility is stronger at high elevations. 1<sup>st</sup> Meeting of the Iberian Ecological Society & XIV AEET Meeting. Barcelona (Spain)
- Moreira X**, Abdala-Roberts L, Parra-Tabla V, Mooney KA (2014) Latitudinal variation in herbivory: Influences of climatic drivers, herbivore identity and natural enemies. SIP15–15<sup>th</sup> International Symposium on Insect-Plant Relationships. Neuchâtel (Switzerland)
- Moreira X**, Mooney KA (2013) Influence of plant genetic diversity on interactions between higher trophic levels. 12<sup>th</sup> Gordon Research Conference on Plant-Herbivore Interactions. Ventura (CA, United States of America)
- Sampedro L, **Moreira X**, Zas R (2013) Genetic variation in inducibility in two Mediterranean Pines. 6<sup>th</sup> meeting of the IOBC-WPRS Working Group "Induced resistance in plants against insects and diseases". Avignon (France)
- Sampedro L, **Moreira X**, Zas R (2012) Nutrient re-allocation and increased fine root production as putative tolerance mechanisms inducible by herbivory in pine trees: looking for belowground microbial partners or moving resources away from herbivores? Workshop on plant-microbe-insect interactions: from molecular mechanisms to ecological implications. Baeza (Spain)
- Carrillo-Gavilán A, **Moreira X**, Zas R, Vilà M, Sampedro L (2012) Early resistance of alien and native pines against two native generalist insect herbivores: no support for the Natural Enemy Hypothesis. 7<sup>th</sup> European Conference on Invasive Alien Species, NEOBIOTA. Pontevedra (Spain)
- Moreira X**, Hernández A, Sampedro L, Zas R (2009) Optimal defense in pine trees: constitutive and induced allocation of resin and polyphenolics in *Pinus radiata*. IOBC Working Group "Induced resistance in plants against insects and diseases". Granada (Spain)
- Zas R, Sampedro L, **Moreira X** (2009) The role of induced defences in the success of an exotic pine: the importance of recognizing your enemies. IOBC Working Group "Induced resistance in plants against insects and diseases". Granada (Spain)
- Moreira X**, Sampedro L, Zas R (2009) Efecto de la disponibilidad de fósforo y de la variación genética en la expresión cuantitativa de defensas constitutivas e inducidas en juveniles de *Pinus pinaster*. IX Congreso Nacional de la Asociación Española de Ecología Terrestre. Úbeda (Spain)
- Moreira X**, Sampedro L, Llusia J, Peñuelas J, Zas R (2009) Fuerte control genético y débil modulación ambiental del contenido de terpenos foliares constitutivos e inducidos por metil jasmonato en plántulas de *Pinus pinaster*. IX Congreso Nacional de la Asociación Española de Ecología Terrestre. Úbeda (Spain)
- Zas R, **Moreira X**, Martíns M, Sampedro L (2008) Tolerance costs evidenced from comparing the impact of an herbivorous insect on a native and an exotic pine species. The evolutionary ecology of plant-animal interactions: from genes to communities (Symposium of the Spanish Association of Terrestrial Ecology). Mallorca (Spain)
- Moreira X**, Costas R, Zas R, Sampedro L (2007) Bioensayos de preferencia del curculiónido *Hylobius abietis* por diferentes calidades de recurso: variación debida a las defensas inducidas en juveniles de *Pinus pinaster* y comparación interespecífica con *Pinus radiata*. I Reunión Científica del Grupo de Trabajo de Sanidad Forestal de la Sociedad Española de Ciencias Forestales. Palencia (Spain)
- Moreira X**, Sampedro L, Zas R (2006) Herbivoría de corteza (*Hylobius abietis*: Curculionidae) en *Pinus pinaster*. Consecuencias sobre el desarrollo y la adjudicación de nutrientes en la planta. II Congreso Ibérico de Ecología: "Crisis de biodiversidad: conocimiento y acción". Lisboa (Portugal)
- Sampedro L, Zas R, **Moreira X** (2006) Influencia de la disponibilidad de nutrientes en la relación entre *Pinus pinaster* y su herbívoro *Hylobius abietis*. II Congreso Ibérico de Ecología: "Crisis de biodiversidad: conocimiento y acción". Lisboa (Portugal)

## Organizer

XV National Meeting of the Spanish Association of Terrestrial Ecology (2021) Session ST.01/2 “Analysis of functional traits in isolated vulnerable ecosystems. Block 2: Islands”. Plasencia (Spain)

## **Mentoring**

### Postdocs

Gabriela Quiroga (2022-2024). Juan de la Cierva-Formación fellowship

Carla Vázquez-González (2021-2024). GAIN/Fulbright fellowship

Eduardo Calixto Soares (2020). Project contract

### PhD students

Lucía Martín Casheda (2020-2024). PhD dissertation at University of Coruña (Spain): “Use of plant-plant communication through volatile organic compounds as a strategy for biological control of pests and diseases in potato plants”

Teresa Quijano-Medina (2018-2022). PhD dissertation at Autonomous University of Yucatan (Mexico): "Context-dependency in the expression of defensive traits in wild cotton and its consequences for herbivores and neighboring plants"

Andrea Cortegoso Galmán (2017-2020). PhD dissertation at University of Santiago de Compostela (Spain): “Elevational gradients in oak defenses and herbivory”

### Undergraduate students

Naila Aguiño Domínguez (2022). Bachelor thesis at University of Santiago de Compostela: “Specificity in induced chemical defenses in potato plants in response to foliar infection by two pathogens”. Qualification: 8.1/10

Violeta María Quiroga Álvarez (2021). Bachelor thesis at University of Santiago de Compostela: “Effect of herbivore density on VOC-mediated communication between potato plants”. Qualification: 10/10

Carla Pastoriza Touriño (2020). Bachelor thesis at University of Santiago de Compostela: “Phylogenetic distance to native oak species as a predictor of tritrophic interactions in exotic oak species”. Qualification: 9.8/10

Viviana Pasch (2019). Bachelor thesis at Ludwig-Maximilians-Universität München (Germany): “VOC-mediated plant-plant communication among potato plants infected by the fungal pathogen *Sclerotinia sclerotiorum*”. Qualification: 9.5/10

Diana Blanco Sobrino (2010). Bachelor thesis at University of Santiago de Compostela: “Optimal defence allocation in *Pinus* species: Constitutive and induced allocation of resin, total phenolics and condensed tannins”. Qualification: 9/10.

Yolanda Magdalena Carrera (2009). Bachelor thesis at University of Santiago de Compostela: “Genetic variation in leaf phenolic content in *Pinus radiata* trees: Exogenous induction with methyl jasmonate and relationship with resistance against *Thaumatopoea pityocampa*”. Qualification: 8/10

María Clara Fernández Peña (2009). Bachelor thesis at University of Santiago de Compostela: “Resin content in *Pinus radiata* trees: Genetic variation and exogenous induction with methyl jasmonate and relationship with resistance against *Hylobius abietis*”. Qualification: 9/10

Diana Blanco Sobrino (2007). Bachelor thesis at University of Santiago de Compostela: “Resin content in young *Pinus pinaster* trees: Effect of soil phosphorus availability on constitutive and jasmonic acid-induced defences”. Qualification: 9/10

## Teaching

### Undergraduate courses

“Vers une agriculture durable” (APP, M203, Bachelor in Biology, University of Neuchâtel, 120 hours in total) 2014-2015

## Research stays

### Postdoctoral stays

Department of Evolutionary Entomology at University of Neuchâtel (Neuchâtel, Switzerland). From May 2014 to May 2015 (12 months).

Department of Ecology and Evolutionary Biology at University of California (Irvine, USA). From January 2012 to February 2014 (24 months).

Department of Tropical Ecology at Autonomous University of Yucatan (Merida, Mexico). July 2013 (4 weeks).

Department of Chemical Ecology at Kungliga Tekniska Högskolan (Stockholm, Sweden). November-December 2011 (4 weeks).

Department of Ecology at University of Granada (Granada, Spain). From June 2011 to July 2011 (4 weeks).

### Predoctoral Stays

Pacific Forestry Centre at Canadian Forest Service (Victoria, British Columbia, Canada). From May 2010 to July 2010 (12 weeks).

## Outreach activities

Project funded by the BNP Paribas Foundation to use citizen science as a tool to understand tritrophic interactions between oaks, insect herbivores and predators: “Tree Bodyguards” (PI: Bastien Castagnéyrol; €235,000; Participant: Xoaquín Moreira; €7,500).

Appearance in newspapers (El País, Faro de Vigo, La Voz de Galicia, Diario de Pontevedra), radio (Efervescencia), TV (La Sexta, Televisión de Galicia)

## Honors, Awards & Fellowships

2020 Spanish I3 Certification

2018 Publons Peer Review Awards 2018 in Environment Ecology



2012 PhD Thesis. Awarded by the Regional Government of Pontevedra as the best PhD Thesis in Science and Technology (€2,000)

2012-2013 University of California-Irvine, Department Ecology & Evolutionary Biology, Fulbright/Ministry of Education and Science postdoc (\$98,553)

2011 PhD Thesis. Awarded by the University of Vigo as Extraordinary Prize of Doctorate

2011 PhD Thesis. Awarded by the Spanish Society of Forest Science as the best Forest Science PhD Thesis (€3,000)

2008-2012 Forestry Research Centre of Lourizán, Department Ecology, Graduate Fellowship, Ministry of Education and Science (€48,000)

2006-2007 Forestry Research Centre of Lourizán, Department Ecology, Graduate Fellowship, Xunta de Galicia (€13,800)

## **Reviewer**

### Peer-reviewed papers

2022 – PNAS, Proceedings of the Royal Society B, Ecology Letters

2021 – New Phytologist (2), Methods in Ecology and Evolution, Functional Ecology, Journal of Chemical Ecology, Ecological Applications, Journal of Ecology

2020 – Journal of Ecology, Annals of Botany, Journal of Chemical Ecology, Oikos, Plant Cell and Environment, New Phytologist, Journal of Evolutionary Biology, Journal of Animal Ecology, Scientific Reports

2019 – Ecology Letters, Oikos, Journal of Ecology (2), Biology Letters, New Phytologist, Journal of Biogeography, Ecology, Oecologia, Functional Ecology

2018 – New Phytologist (2), Functional Ecology (2), Ecology, The American Naturalist, Journal of Ecology (3), Oecologia, Plant Biology, American Journal of Botany, Annals of Botany, Proceedings of the Royal Society B

2017 – Ecology Letters, New Phytologist, Ecology (2), Functional Ecology, Proceedings of the Royal Society B (2), Frontiers in Plant Science, Ecology and Evolution, Journal of Applied Ecology, Tree Physiology, Ecological Entomology, Oecologia (2), Global Ecology and Biogeography, Molecular Ecology (2)

2016 – Ecology Letters, Oikos, Journal of Chemical Ecology, PLoS ONE (2), Trends in Ecology and Evolution, Scientific Reports, Oecologia (3), Ecosphere, Ecology and Evolution

2015 - New Phytologist, Functional Ecology, Global Ecology and Biogeography, Oecologia, PLoS ONE (2), Tree Physiology, Acta Oecologica, Forestry, Annals of Forest Science, Current Opinion in Insect Science

2014 – Ecology Letters, Global Change Biology, Functional Ecology, Oikos (2), PLoS ONE (2), Entomologia Experimentalis et Applicata (2), Plant Biology, BMC Ecology, Agricultural and Forest Entomology, Forest Ecology and Management, Silva Fennica

2013 - New Phytologist, Ecology, Journal of Ecology, Oecologia, Ecological Entomology

2012 - Scientia Agricola, Forest Systems

## Projects

2022 – Swedish Research Council (Prisma)

2021 – Spanish Ministry of Science and Innovation, Swedish Research Council (Prisma)

2018 – Spanish Ministry of Economy and Competition

2016 – New Zealand's Marsden Fund Council, Czech Science Foundation

2015 – CONICYT-Chile

2013 – Netherlands Organization for Scientific Research

## **Editorial Board**

2022 – Environmental Entomology

2021 – Arthropod-Plant Interactions

2019 – Scientific Reports

## **PhD committee**

2020 – Alba Lázaro-González (University of Granada, Spain)

2019 – Daniela Weber. Swedish University of Agricultural Sciences (SLU, Alnarp, Sweden)

2017 – Pilar Fernández-Conradi. University of Bordeaux (France)