

Fire recurrence impacts the functioning and phylogenetic structure of fungal communities in Mediterranean pine forests

Leticia Pérez-Izquierdo, Mario Zabal-Aguirre, Santiago C. González-Martínez, M. Verdú, Marc Buée, A. Rincón

▶ **To cite this version:**

Leticia Pérez-Izquierdo, Mario Zabal-Aguirre, Santiago C. González-Martínez, M. Verdú, Marc Buée, et al.. Fire recurrence impacts the functioning and phylogenetic structure of fungal communities in Mediterranean pine forests. 14. MEDECOS & 13. AEET meeting. Human driven scenarios for evolutionary and ecological changes, Jan 2017, Séville, Spain. 268 p. hal-02734906

HAL Id: hal-02734906
https://hal.inrae.fr/hal-02734906

Submitted on 2 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License



XIV MEDECOS
&
XIII AEET meeting

Human driven scenarios for evolutionary and ecological changes

Abstract book

31st January - 4th February 2017
Seville, Spain

XIV MEDECOS & XIII AEET meeting



AEET
ASOCIACIÓN ESPAÑOLA DE ECOLOGÍA TERRESTRE

Estación Biológica Doñana CSIC

EXCELENCIA SEVERO OCHOA

UNIVERSIDAD DE SEVILLA

Abstract book of the XIV MEDECOS & XIII AEET meeting,
Seville, Spain, 31st January - 4th February 2017

Issued in Open Access, under the terms of Commons attribution Non Commercial License
Doi.: 10.7818/MEDECOSandAEETCongress.2017

Editorial deadline: 20th December, 2016.

Publisher: Asociación Española de Ecología Terrestre (AEET)
C/ Tulipán s/n, 28399, Móstoles, Madrid, Spain

Layout: Imprenta Sand, S.L. Seville. Spain.

XIV MEDECOS & XIII AEET meeting

MEDECOS is an international conference organized by ISOMED, the International Society of Mediterranean Ecology, which aims to bring together the scientific community interested in Mediterranean ecosystems. **AEET** is the Spanish ecological society mainly devoted to terrestrial systems.

The origins of MEDECOS date back to March 1971, when an international group of scientists convened in Valdivia, Chile, to discuss their work on Mediterranean-climate ecosystems. MEDECOS has been hosted every 3-4 years in different locations of the five Mediterranean areas of the world (Mediterranean Basin, SW Australia, California, Central Chile and the Cape Region in South Africa). In 2017, MEDECOS will be at the University of Seville (Spain), in the "*Reina Mercedes*" Science Campus, simultaneously with the biennial meeting of the Spanish Association for Terrestrial Ecology (AEET).

The main focus of the joint conference is the ecology and evolution of Mediterranean ecosystems and their species, from plants to animals and also microorganisms. By uniting scientists and students whose research focuses on Mediterranean ecosystems, we expect to gain insights into the similarities and differences in how they function, change and evolve. The conference will also host a regular AEET meeting, thus more general topics on any aspect of ecology will be also considered.

The Conference main topics are:

- Comparative ecology and evolution
- Historical biogeography of Mediterranean lineages
- Current species conservation challenges
- Biodiversity: species interactions, networks, communities and phylogenetics
- Evolutionary and ecological drivers of Mediterranean ecosystems as biodiversity hotspots
- Ecophysiology and functional traits
- Ecosystem functioning and services: challenges and risks in a changing world
- Consequences of biotic and environmental global changes for Mediterranean ecosystems

This meeting is co-organized and supported by the Spanish Association for Terrestrial Ecology (AEET), the Doñana Biological Station (EBD-CSIC) and the University of Seville (US).

Index

Organizing Committee 5
Scientific Committee 6

Daily Schedule
- Tuesday 31st January, 2017 7
- Wednesday 1st February, 2017 8
- Thursday 2nd February, 2017 9
- Friday 3rd February, 2017 / Saturday 4th February, 2017 10

Scientific Program: Sessions (S) and Symposia (Sp) 11

Abstracts of contributions
- Special invited lectures 14
- S. 01: Comparative ecology and evolution 15
- S. 02: Historical biogeography of Mediterranean lineages 26
- S. 03: Current species conservation challenges 33
- S. 04: Biodiversity: species interactions, networks, communities and phylogenetics 44
- S. 05: Evolutionary and ecological drivers of MTEs as biodiversity hotspots 67
- S. 06: Ecophysiology and functional traits 71
- S. 07: Ecosystem functioning and services: challenges and risks in a changing world 95
- S. 08: Consequences of biotic and environmental global changes for MTEs 109
- Sp.01: Across-kingdom mutualistic interactions of Mediterranean endemic plants 128
- Sp.02: Filling current knowledge gaps: understanding the role of plant-soil interactions in the MTEs 132
- Sp.03: Mediterranean Ecosystem Services 146
- Sp.04: Eco-evolutionary dynamics in a changing world: integrating genes, traits and ecosystems 151
- Sp.05: Insights on the fourth dimension: the palaeoecological approach to modern ecological questions 155
- Sp.06: Evolutionary and ecological assembly of plant assemblages in biodiversity hotspots 159
- Sp.07: Contrasting worldwide functional trait trends in Mediterranean-type ecosystems 163
- Sp.08: Fire and Plant-Animal Interactions 168
- Sp.09: Local adaptation in the Mediterranean 173
- Sp.10: Resilience and criticality in Mediterranean ecosystems 177
- Sp.11: Evolutionary responses to climate change. Evidence from Mediterranean plant populations 188
- Sp.12: Establishing linkages between species interactions and ecosystem functioning and services 193
- Sp.13: Investigating ecological and evolutionary processes with NGS 201
- Sp.14: Fire-driven evolution of MTE floras 206
- Sp.15: Plant reproductive ecology and evolution in a changing Mediterranean climate 210
- Sp.17: The role of ecological interactions in recovering self-regulating and diverse MTE 220
- Sp.18: Origin of the Mediterranean Climate 224
- Sp.19: Mediterranean High-Mountain habitats: challenges for research & a global conservation concern 227
- Sp.20: Seed dispersal and frugivory in changing Mediterranean landscapes 233
- Sp.21: Ecoinformatics: data science brings new avenues for ecology 242
- Sp.22: Plant Invasions in Mediterranean-Type Ecosystems 246

Authors index 255
Acknowledgments 267

Organizing Committee

Chairs

- Juan Arroyo (University of Seville), Spain
- Montserrat Vilà (Doñana Biological Station, EBD-CSIC), Spain

Local Organizing Committee

- Montserrat Arista (University of Seville), Spain
- Ignasi Bartomeus (Doñana Biological Station, EBD-CSIC), Spain
- Adrián Escudero (Rey Juan Carlos University), Spain
- Marcial Escudero (University of Seville), Spain
- Antonio Gallardo (University Pablo de Olavide), Spain
- Oscar Godoy (Institute of Natural Resources and Agrobiology of Seville, IRNAS-CSIC), Spain
- Susana Gómez (University of Cádiz and (CR2), University of Chile), Spain and Chile
- Lorena Gómez-Aparicio (Institute of Natural Resources and Agrobiology of Seville, IRNAS-CSIC), Spain
- Jennifer Leonard (Doñana Biological Station, EBD-CSIC), Spain
- Francisco Lloret (Center for Ecological Research and Forestry Applications, CREAF-UAB), Spain
- Fernando Ojeda (University of Cádiz), Spain
- Xavier Picó (Doñana Biological Station, EBD-CSIC), Spain
- Susana Redondo-Gómez (University of Seville), Spain
- Eloy Revilla (Doñana Biological Station, EBD-CSIC), Spain

International ISOMED Advisory Committee

- Kingsley Dixon (University of Western Australia), Australia
- Grant Wardell–Johnson (Curtin University), Australia
- Pablo Marquet (Catholic University of Chile), Chile
- Margarita Arianoutsou (University of Athens), Greece
- Costas A. Thanos (National and Kapodistrian University of Athens), Greece
- Vanda Acacio (University of Lisbon), Portugal
- Miguel Bugalho (University of Lisbon), Portugal
- Francisco Moreira (University of Lisbon), Portugal
- Francisco Castro Rego (University of Lisbon), Portugal
- Karen Esler (Stellenbosch University), South Africa
- Dave Olson (Conservation Earth Consulting), USA
- Felicia Federico (UCLA Institute of the Environment and Sustainability), USA
- Phil Rundel (University of California), USA

AEET Board

- Francisco Lloret (Center for Ecological Research and Forestry Application, CREAF-UAB), Spain
- Anna Traveset (Mediterranean Institute for Advanced Studies, IMEDEA-UIB-CSIC), Spain
- Adrián Escudero (Rey Juan Carlos University), Spain
- Luis Cayuela (Rey Juan Carlos University), Spain
- Adela González Megías (University of Granada), Spain
- Ana López Llandrés (Institute for Research in Insect Biology, IRBI-UFR), France
- Ignasi Bartomeus (Doñana Biological Station, EBD-CSIC), Spain
- María Begoña García-González (Pyrenean Institute of Ecology, IPE-CSIC), Spain
- Susana Rodríguez-Echeverría (University of Coimbra), Portugal

Technical Secretariat

- Leyre Jiménez-Eguizábal (Asociación Española de Ecología Terrestre), Spain
- Giulia Crema (Doñana Biological Station, EBD-CSIC), Spain

Audiovisual technical coordinator

- Antonio Carmona (University of Seville), Spain

Scientific Committee

- Mary T. Kalin Arroyo (University of Chile), Chile
- Wolfgang Cramer (Mediterranean Institute of marine and terrestrial Biodiversity and Ecology), France
- Felix Forest (Royal Botanic Gardens), UK
- Antonio Gallardo (University of Pablo de Olavide), Spain
- M. Begoña García (Pyrenean Institute of Ecology, IPE-CSIC), Spain
- José Lahoz-Monfort (University of Melbourne), Australia
- Hans Lambers (The University of Western Australia), Australia
- Jennifer Leonard (Doñana Biological Station, EBD-CSIC), Spain
- Fernando T. Maestre (University of Rey Juan Carlos), Spain
- Berta Martín-López (Leuphana University of Lüneburg), Germany
- Jeremy Midgley (University of Cape Town), South Africa
- Catarina Moura (University of Coimbra), Portugal
- Ingrid Parker (University of California Santa Cruz), USA
- Aníbal Pauchard (University of Concepcion), Chile
- Juli Pausas (Desertification Research Centre, CIDE-CSIC), Spain
- Anton Pauw (Stellenbosch University), South Africa
- Eloy Revilla (Doñana Biological Station, EBD-CSIC), Spain
- Francesc Sabater (University of Barcelona), Spain
- Anna Traveset (Mediterranean Institute for Advanced Studies, IMEDEA-UIB-CSIC), Spain
- Fernando Valladares (National Museum of Natural History, MNCN-CSIC), Spain
- Pablo Vargas (Royal Botanic Garden, RJB-CSIC), Spain
- Cyrille Violle (Centre for Evolutionary and Functional Ecology, CEFE-CNRS), France

S.04-37-Oral

Fire recurrence impacts the functioning and phylogenetic structure of fungal communities in Mediterranean pine forests

Pérez-Izquierdo, L.[1], Zabal-Aguirre, M.[2], González-Martínez, S.C.[3], Verdú, M.[4], Buée, M.[5], Rincón, A.[6]

(1) Instituto de Ciencias Agrarias (ICA-CSIC). (2) Instituto de Ciencias Agrarias-CSIC. (3) INRA, UMR 1202. (4) Centro de Investigaciones sobre Desertificacion -CIDE- (CSIC/UV/GV). (5) UMR-INRA-UL, Centre Nancy. (6) Instituto de Ciencias Agrarias-CSIC

Correspondence e-mail: [lperez@ica.csic.es]

Fire is a major disturbance of Mediterranean forests. Predicted wildfire frequency increases associated with global change may alter soil fungal communities with important consequences for the functioning of forest ecosystems. Forests with low/high fire recurrence regimes of two representative Mediterranean pines, Pinus pinaster and Pinus halepensis, were monitored. Combining high-throughput sequencing with phylogenetic methods and soil enzymatic tests, we evaluated whether fire recurrence affected the structure and functioning of soil fungal communities. For P. halepensis, high fire recurrence increased activities related with carbon, nitrogen and phosphorous cycles, while P. pinaster soils barely responded. Concerning the phylogenetic structure of fungal communities, recurrent fire induced a clustering of the fungal community of P. halepensis marked by an overrepresentation of Basidiomycetes. For P. pinaster, only when representative fungal guilds (i.e. ectomycorrhizal, saprotrophic) were separately analyzed this fire-related clustering was detected. Compared with common diversity metrics, fungal phylodiversity of P. halepensis better explained key soil activities implicated in the mobilization of nitrogen and phosphorous. Our results reveal that fire can filter certain fungal groups and affect relevant ecosystem functions, changes that can be of main importance for the resilience of Mediterranean forest ecosystems.

S.04-38-Poster

Secondary vegetation in the olistostromic complex of La Puebla de Cazalla (Sevilla, Spain)

Pulgar, I.[1], Herrera, J.M.[2]

(1) Universidad Pablo de Olavide. (2) Universidad Pablo de Olavide

Correspondence e-mail: [inigo.pulgar@gmail.com]

Secondary vegetation in the olistostromic complex or undifferentiated subbetic complex of La Puebla de Cazalla (Sevilla Spain) is studied. This territory is included between the termomediterranean and mesomediterrranean belt, mainly in the first. Biogeographycal range of the territory are Mediterranean region (Western Mediterranean subregion), Betic province and Hispalense sector. The main plant communities inventoried correspond to serial climax forest communities, a termophylus and basophylus Holm oak forest. The thorny schrubland (with Rhamnus, Chamaerops and Asparagus), rosemary schurbland (Rosmarinus officinalis), brooms (Retama sphaerocarpa), open thyme schrubland (Thymbra-Thymus) and arid meadows (Machrocloa tenacissima) are the best types of vegetation represented.