



BEEs

The LifeWatch ERIC Biodiversity & Ecosystem eScience Conference

Seville
22-24/05/23



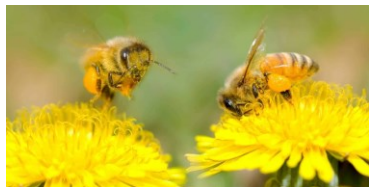
Threats and challenges to biodiversity and ecosystem conservation from an eScience perspective



**Biodiversity monitoring through ecological interaction networks:
plant canopy-recruit and plant-mycorrhizal fungi interactions
in the Andalusian Red Natura 2000**

Ecological interactions as components for biodiversity maintenance and ecosystem services

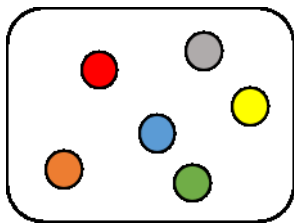
(Bascompte et al. 2006, *Science*. DOI: 10.1126/science.1123412; Montoya et al. 2012, *Trends Ecol Evol*. DOI: 10.1016/j.tree.2012.07.004)



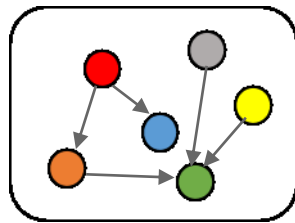
Interactions vs Species data in biodiversity monitoring

Interaction networks contribute to forest ecosystem structure and dynamics

Species richness-based Species interaction-based



N = 6 species



N = 6 species
(+ 5 interactions)

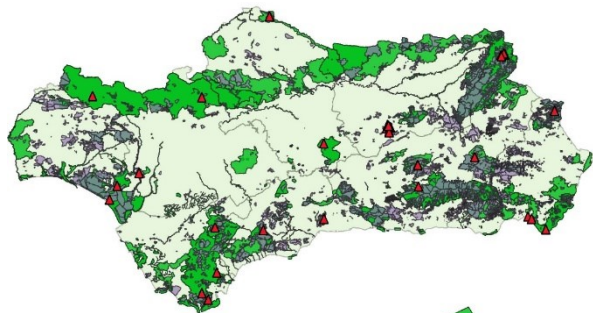


Plant canopy-recruit interactions



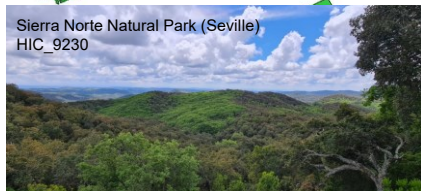
Plant-mycorrhizal fungi interactions

Sampling sites across the Andalusian RN2000



Special Areas of Conservation (based on Habitats Directive):

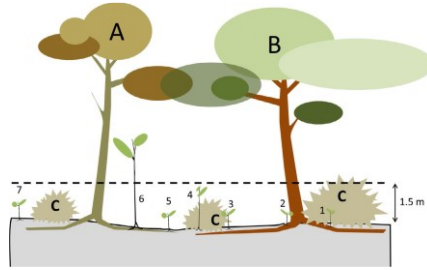
- HIC_4090: Endemic supra-oro-Mediterranean heaths with gorse. N = 1.
- HIC_5210: Arborescent matorral with Juniperus spp. N = 1.
- HIC_5220: Arborescent matorral with Zyziphus. N = 3.
- HIC_9230: Galicio Portuguese oak woods with Quercus robur and Quercus pyrenaica. N = 2.
- HIC_9240: Quercus faginea and Quercus canariensis Iberian woods. N = 2.
- HIC_9320: Olea and Ceratonia forests. N = 2.
- HIC_9330: Quercus suber forests. N = 3.
- HIC_9340: Quercus ilex and Quercus rotundifolia forests. N = 3.
- HIC_9520: Abies pinsapo forests. N = 1.
- HIC_9530: (Sub-) Mediterranean pine forests with endemic black pines. N = 5.
- HIC_9540: Mediterranean pine forests with endemic Mesogean pines. N = 9.



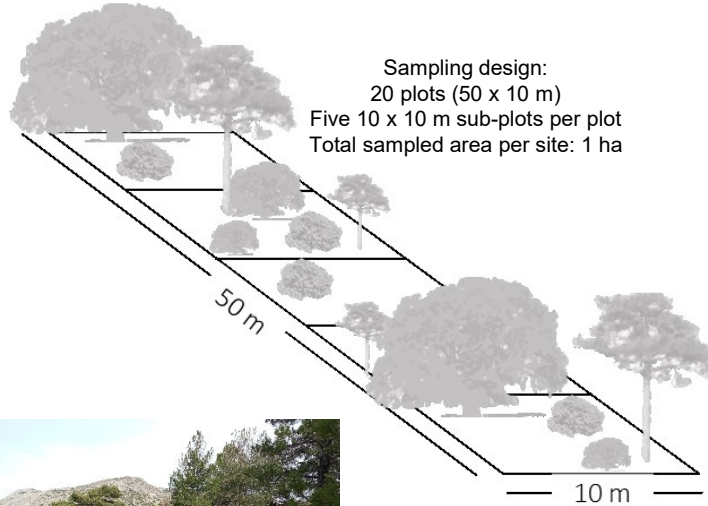
Cabo de Gata and Nijar Natural Park (Almería) HIC_5220



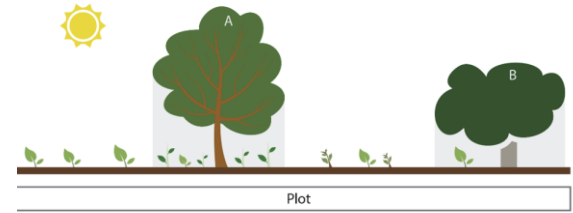
Vegetation sampling methods and plant canopy-recruit interaction networks













Alcántara et al. (2019). DOI: 10.1111/jvs.12795



Plant Recruitment Network



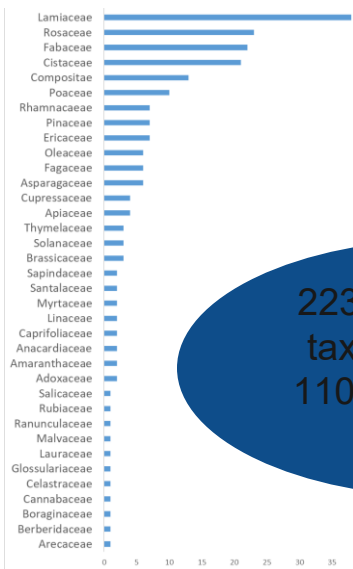
Canopy	Recruit	Frequency
		4
		1
		1
		4
		2

Verdú et al. (2022). *Ecology*. DOI: 10.1002/ecy.3923

Plant cover and plant canopy-recruit databases of woody plant communities across 32 sites within 16 protected areas from the Andalusian RN2000

Plant composition and cover

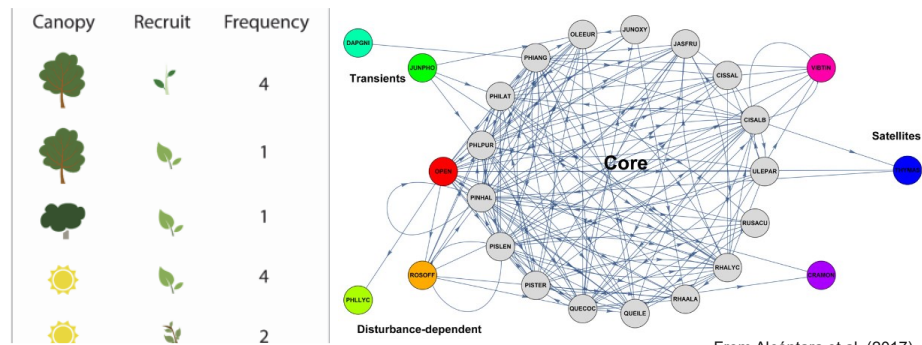
(<http://hdl.handle.net/10261/289062>)



223 vascular plant taxa belonging to 110 genera and 38 families

Plant recruitment networks

(<http://hdl.handle.net/10261/288985>)

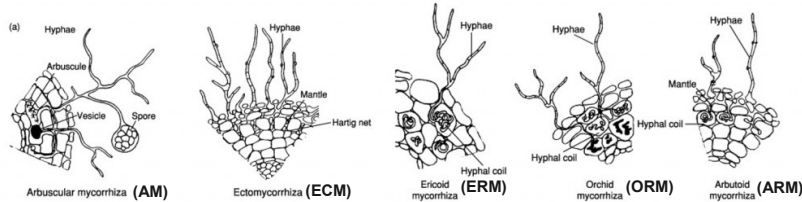


From Alcántara et al. (2017)

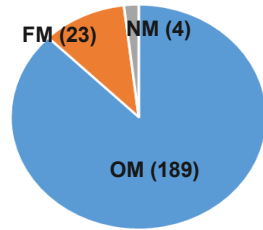
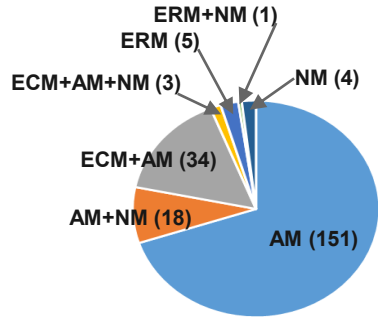
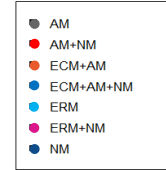
100321 recruiting individuals involved in 5617 paired interactions

Mycorrhizal type and mycorrhizal status database for woody plant species sampled across 32 plant communities within 16 protected areas from the Andalusian RN2000

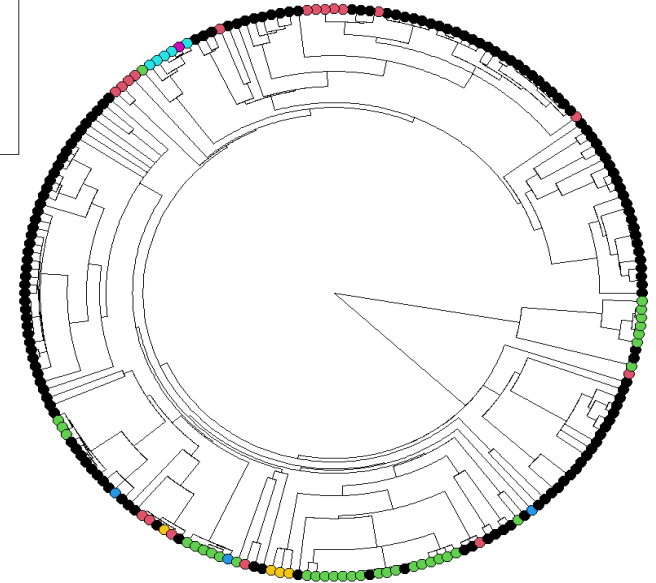
<http://hdl.handle.net/10261/295372>



Retrieved from Egerton-Warburton et al. (2005)



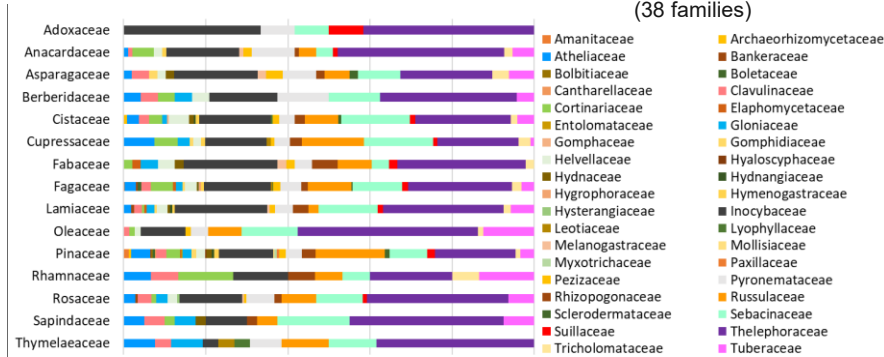
FM: facultative mycorrhiza
NM: no mycorrhiza
OM: obligate mycorrhiza



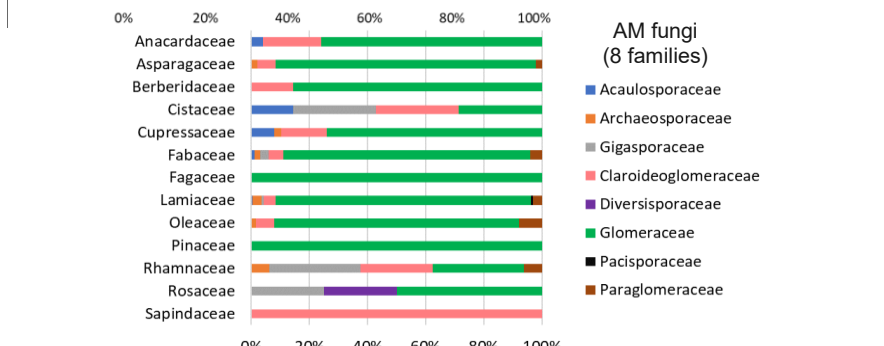
Mycorrhizal type and status assignments are based on:
Bueno et al. (2021) and FungalRoot (Soudzilovskaia et al. 2020) databases

associated to roots of woody plant species sampled in Andalusian RN2000

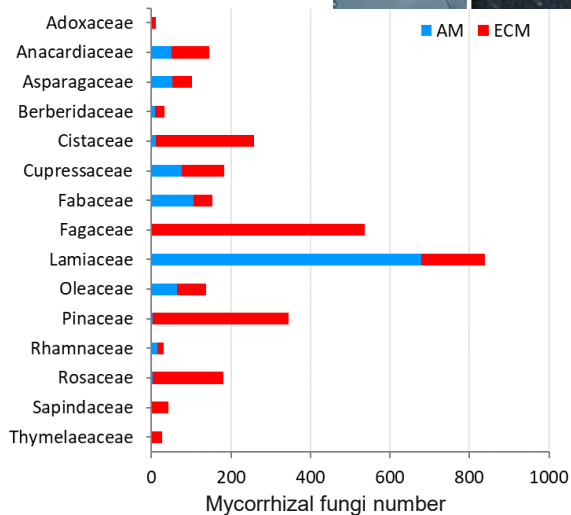
ECM fungi (38 families)



AM fungi (8 families)



Host plant (family level)





Seville, 22-24 May 2023

Threats and challenges to biodiversity and ecosystem conservation from an eScience perspective



LifeWatch ERIC is an European Research Infrastructure Consortium providing e-Science research facilities to scientists investigating biodiversity and ecosystem functions and services in order to support society in addressing key planetary challenges.

This study was funded by Ministry of Science and Innovation of Spain through European Regional Development Fund [SUMHAL, LIFEWATCH-2019-09-CSIC-4, POPE 2014-2020].

The **SUMHAL project** – Sustainability for Mediterranean Hotspots in Andalusia Integrating LifeWatch ERIC – (funded by ERDF Spain, Andalusia) implements a strategy for the conservation of biodiversity in sustainable natural systems of the western Mediterranean area. Its main objective is to combine the results of the fieldwork with Virtual Research Environments for the storage, management, analysis and dissemination of the conservation status of Andalusian biodiversity ecosystems.



BEeS

The LifeWatch ERIC Biodiversity & Ecosystem eScience Conference

Seville
22-24/05/23



Threats and challenges to biodiversity and ecosystem conservation from an eScience perspective



UNIÓN EUROPEA
Fondo Europeo de Desarrollo Regional
Una manera de hacer Europa



Thank you!

www.lifewatch.eu/bees-2023

