

Study identifies dominant fungi and their attributes on the planet's soils

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An international research team including University of Alicante researcher Fernando T. Maestre has identified a list of some 80 species of dominant fungi that can be found in soils all over the world. The

study, published in *Nature Communications*, identifies the attributes that allow these species to be so dominant on a global scale, and how they are associated with certain soil and climate characteristics. This information is key to understanding the impact of climate change on these organisms.

The fungi that live in the [soil](#) play a key role as decomposers of organic matter in natural and agricultural ecosystems. Thus, these microorganisms control an essential process for maintaining [soil fertility](#), which in turn is essential for food production. However, understanding the distribution and ecology of these fungi is still a challenge, partly because of their [high diversity](#) and the difficulties associated with their identification and study.

Scientists from Australia, the United Kingdom, the United States, China and Spain, including UA researcher Fernando Maestre, have characterized the [fungal populations](#) that inhabit soils around the globe via sampling carried out in 235 ecosystems on all continents, including desert areas, tropical forests and polar ecosystems. The researchers have found that about 80 species (less than 0.1 percent of the [fungal species](#) found) comprise about 20 percent of the populations of these organisms in the soils studied.

Fungal communities follow a dynamic similar to that observed with the distribution of wealth: A few people concentrate most of the wealth existing on Earth. Similar patterns have also been observed in other organisms, such as trees in the Amazon Jungle or soil bacteria, says Manuel Delgado-Baquerizo, another of the study's authors.

First global mushroom atlas

The researchers have studied the affinity of soil fungi for certain soil and climate characteristics, enabling them to develop the first global atlas of soil fungi. The study reveals how to predict clusters of dominant soil

fungi using environmental information, which is a fundamental step to map the distribution of these organisms at a global level and understand how climate change is going to affect their distribution in the future, UA researcher Fernando Maestre says.

The researcher used the most advanced genomic techniques to better understand the features of these fungi and why they are so dominant in certain soils. According to Maestre, by studying the characteristics of dominant [fungi](#) in more detail, the researchers found that these include aspects such as their ability to disperse over long distances via the wind, and the fact that they have numerous genes associated with the ability to withstand adverse environmental conditions and to capture resources such as nutrients.

More information: Eleonora Egidi et al. A few Ascomycota taxa dominate soil fungal communities worldwide, *Nature Communications* (2019). [DOI: 10.1038/s41467-019-10373-z](https://doi.org/10.1038/s41467-019-10373-z)

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