Airborne hyphae and other propagules in Mérida (Badajoz, SW. Spain)

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Introduction

Apart from pollen grains and fungal spores other kind of biological propagules are found in the atmosphere in a significant amount, these include hyphae fragments from mycelia, spores of Mycetozoa (myxomycetes), sporangia from oomycetes and spores from mosses (Fig. 1). Their importance lies in the effects thy can cause, as allergies, plant diseases or biodeterioration. The aim of this work is to evaluate their presence in a city of the SW of Spain.

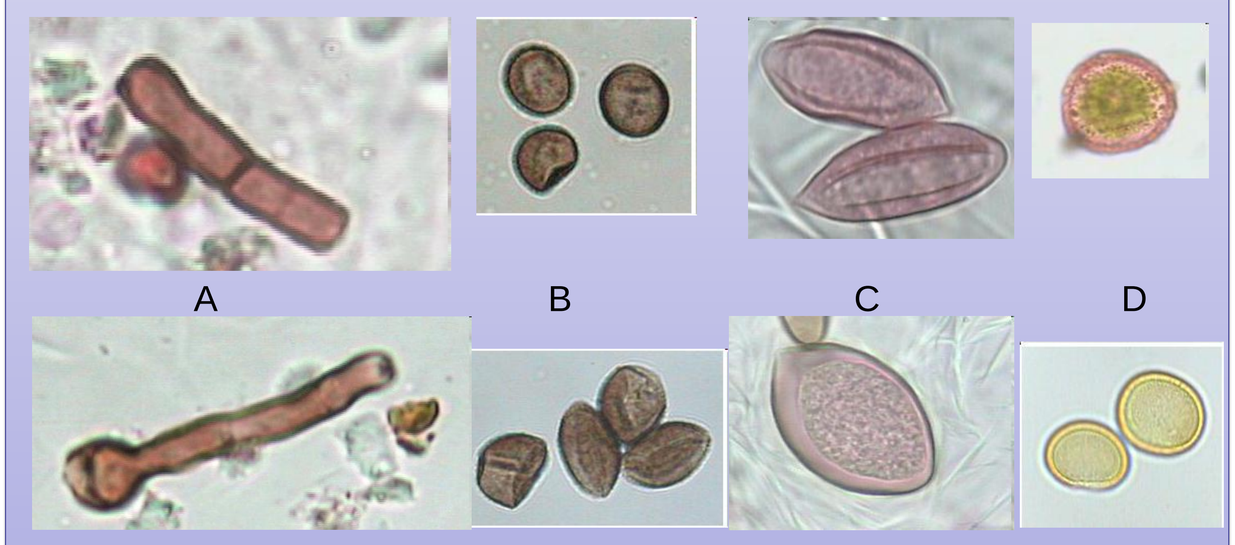

Fig 1. Images of hyphae (A), spores of Mycetozoa (B), sporangia of oomycetes (C), and spores of mosses (D)

Results

Most hyphae recorded were dematiaceous type, with an annual average concentration of 116 propagules/m^3, with the highest values in summer and one second peak in October, maximum daily peak reached was 678 propagules/m^3 on 20th July; hyaline hyphae were recorded with an average concentration between 1-2 propagules/m^3, mainly in Spring and Autumn (Fig. 2A).
Spores of Mycetozoa recorded were included in *Leocarpus* type, with an annual average concentration of 17 propagules/m^3 and with the greatest values in Autumn and the lowest in Spring, a peak of 459 propagules/m^3 were found on 27th October (Fig. 2B).
Peronospora type, that includes sporangia from oomycetes showed an average concentration of 4 propagules/m^3, with three annual peaks, which in order of importance were October, February and June, a maximum peak was reached on 14th February with 67 propagules/m^3 (Fig. 2C).
Moss spores were recorded mainly on September and described as *Funaria* type, with a average concentration of 5 spores/m^3, on 20th September was reached a peak of 295 propagules/m^3 (Fig. 2D).
Temperature and relative humidity showed statistically significant correlation, positive with hyphae, *Leocarpus* and *Funaria* and negative with *Peronospora* in the case of temperature and inversely in the case of relative humidity.

Material and Methods

Sampling was taken using a seven day recording spore trap (Burkard) for two years (1998-1999), it was located 15 meters over the ground level at the terrace roof of the hospital of Mérida (SW Spain). Propagules were identified and counted using two longitudinal scans over the slides with x1000 microscope resolution. Meteorological data and propagules concentrations were analysed using Spearman correlation coefficient.

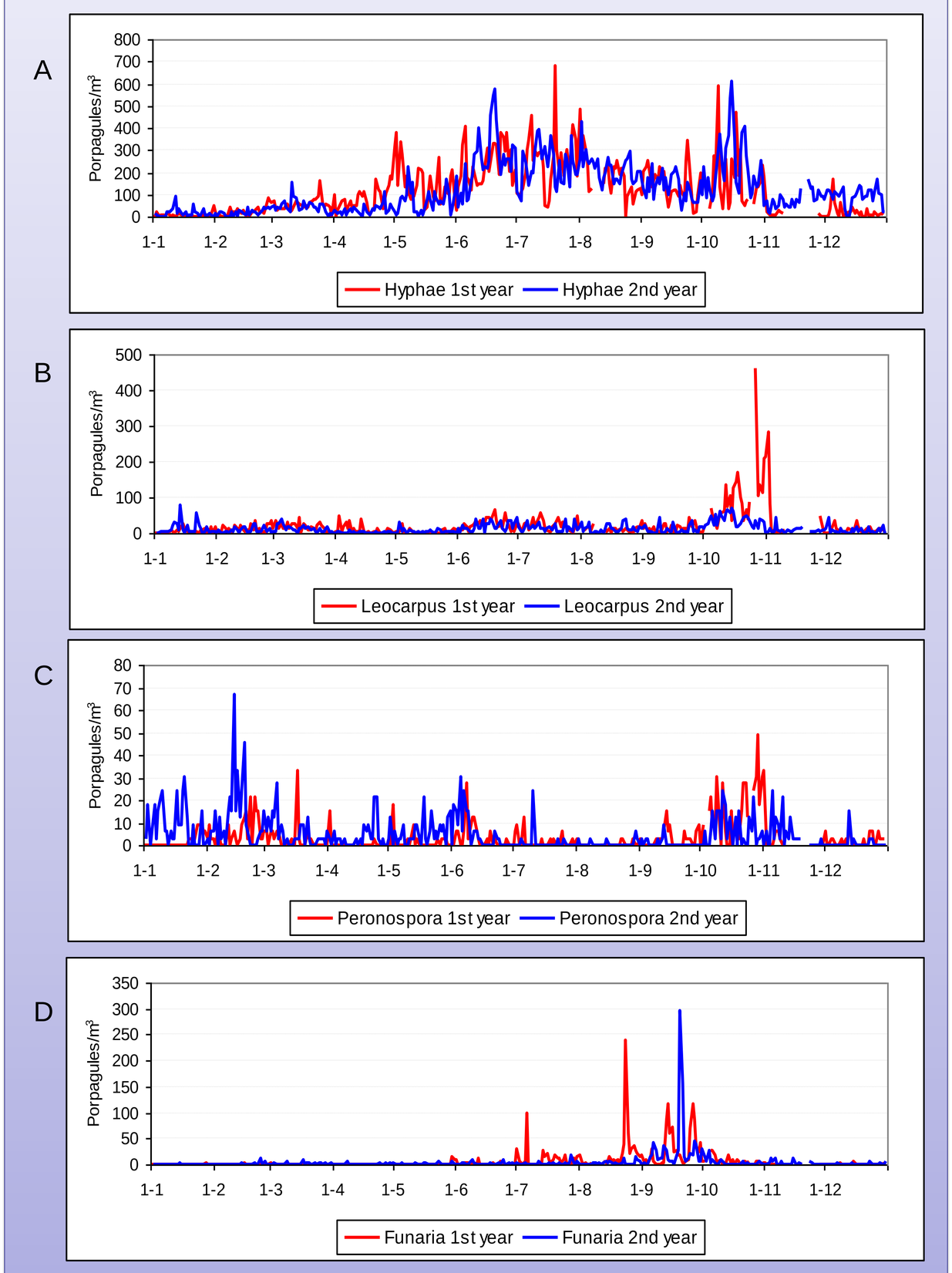

Fig. 2. Annual concentration of different airborne propagules.

Conclusions

Hyphae, Mycetozoa spores, oomycetes sporangia and moss spores are present in the air by 5% of total propagules, excluding pollen grains. Hyphal fragments can constitute an important way to disperse viable fungi, and their dispersion depend mainly on environmental conditions rather than internal phenological rhythms of reproductive structures. *Leocarpus*, *Peronospora* and *Funaria* propagules types, although present in low concentrations, showed seasonal patterns that can help to understand their dispersal behaviour.

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