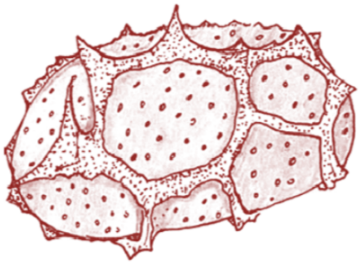

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Variations in the fungal spore detection within urban environments

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Background. The analysis of fungal spores in the atmosphere is crucial for understanding the dynamics of terrestrial ecosystems and their interaction with urban environments. Fungal spore concentrations influence not only agricultural production but also human health due to the respiratory diseases they cause, including allergies, which results in high economic losses (Simović et al., 2023). However, the spore airborne concentrations may vary depending on land use and local environmental conditions, which underlines the importance of investigating their presence in different locations within urban areas (Singh & Kumar, 2022). The aim of this study was to analyze the variation in fungal spore diversity and concentrations in seven sampling sites in the city of Malaga (southern Spain).

Methods. The monitoring was carried out using a Hirst-type volumetric pollen trap situated at seven sampling locations within Malaga city. Malaga is a coastal Mediterranean urban area, densely populated, with an uneven distribution of the green areas and diverse land use. Both coastal and inland locations were sampled in densely and more sparsely populated neighborhoods with different abundance of green areas. The pollen trap was placed in each location for two hours. Fungal spores were identified and counted, and their relative abundance was calculated. For each sampling location, the Shannon H index was calculated to determine the spore diversity.

Results. The results revealed an overall higher relative abundance of the spore types *Cladosporium cladosporioides* (Fresen.) G.A. de Vries, *Cladosporium herbarum* (Pers.) Link, *Coprinus* Pers., 1797, Aspergillaceae, *Alternaria* Nees, *Dreschlera* S.Ito, 1930 and *Myxomycetes*. A greater diversity was observed in the locations that combined extensive green areas and densely populated neighborhoods. One of the sampling points (i.e., Camino de San Rafael) presented a slightly higher spore diversity due to the greater heterogeneity of its surroundings, combining the presence of green areas, densely populated areas, industrial estates and wastelands. Minority spore types were identified in some locations, which have not been found in the rest of the locations, such as *Arthrinium* Kunze, 1817, *Botrytis* P.Micheli, 1729, *Curvularia* Boedijn, *Erysiphe* R.Hedw. ex DC., 1805 and *Spondycladiella*.

Conclusions. The variation in the abundance of fungal spores in the atmosphere of Malaga may be a function of land use, which highlights the relevance of urban planning in the prevention of respiratory allergies and, thus, in promoting healthier and more sustainable urban environments. In addition, these results bring to the fore the importance of monitoring airborne spores in different parts of the cities. Future research is required to assess the impacts of microclimatic conditions on fungal spore dynamics.

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