Assessing the Impact of Climate Change on Indoor Fungal Contamination in Lisbon Metropolitan Area Primary Schools: A Comprehensive Study

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The increasing occurrence of severe weather events caused by global climate change raises concerns about indoor fungi [1,2]. These changes can potentially alter fungal communities, promoting resistant strains, and intensifying mycotoxin production, having significant implications for human health [3]. In educational settings, inadequate ventilation and high moisture levels amplify indoor fungal growth and mycotoxin contamination, posing a health risk that contributes to respiratory illnesses and allergic reactions in children and school staff [4,5,6]. Our research explores the complex relationship between climate change and fungal diseases, highlighting the importance of temperature and moisture in driving fungal growth and mycotoxin production. This project focuses on the Lisbon metropolitan area and aims to assess the indoor levels of contamination and human exposure to azole-resistant fungi and mycotoxins in primary schools. The objective of this investigation is to carry out a comprehensive microbial characterization with regards to the exposure to fungal contamination in primary educational institutions and to achieve that goal a comprehensive sampling campaign was employed, by the use of active and passive sampling methods and material collection from schools. Air samples utilizing the MAS-100 device, which collected 400L at a flow rate of 200 L/min, and the Anderson six-stage device, which collected 200L at a flow rate of 28.3 L/min were performed. Additionally, we collected samples of mops and surface swabs, and samples of settled dust through vacuuming and EDC, located in the sampling sites at 1.5 m height for 30 days, and collected during, approximately for 30 days. The samples will be analysed by culture-based methods, through the inoculation onto two different culture media: malt extract agar (MEA) supplemented with chloramphenicol (0.05%) incubated at 27ºC and dichloran-glycerol agar (DG18), incubated at 27ºC and 37ºC for 6 days. We will also be preforming molecular detection of the selected fungal sections (*Aspergillus* sections *Circumdati*, *Flavi*, *Fumigati* and *Nidulantes*). To evaluate the degree of mycotoxin contamination in school environments, we will employ high-performance liquid chromatography (HPLC) to detect the presence of 38 different mycotoxins. The preliminary results that will be presented are specifically related to the active air sampling. The ultimate objective is to provide essential insights for the development of effective risk management strategies that safeguard the health of school children and personal in the face of growing fungal threats.

Acknowledgements:

H&TRC authors gratefully acknowledge FCT/MCTES national support through the 2023.01366.BD; UIDB/05608/2020; UIDP/05608/2020 and PL/2022/InChildhealth/BI/12M.

The ESTeSL- Escola Superior de Tecnologia e Saúde de Lisboa, Instituto Politécnico de Lisboa,national support through IPL/IDI&CA2023/FoodAlleEU; IPL/IDI&CA2023/ASPRisk and IPL/IDI&CA2023/ARAFSawmills

Partly funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the Swiss State Secretariat for Education, Research, and Innovation (SERI), or the United Kingdom Research and Innovation (UKRI), or the Australian National Health & Medical Research Council (NHMRC). Neither the European Union nor the granting authorities can be held responsible for them.

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