

# Mucorales prevalence and azole-resistance surveillance on different indoor environments: a menace to be tackled

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## Purpose

Mucorales species can cause severe infections among immunocompromised patients. Mucormycosis is associated with a great deal of morbidity and infections caused by Mucorales species among patients receiving triazole prophylaxis.<sup>1</sup> Considering the clinical relevance of Mucorales order, the prevalence of these fungal species and azole-resistance surveillance should be ensured in fungal exposure assessments.

In this study, the prevalence of Mucorales species indoor was determined in different occupational settings and dwellings. Azole-resistant Mucorales were determined by morphological and molecular criteria.

## Methods

Electrostatic dust cloth (EDC) from Dwellings (n=79) and Bakeries (n=27), raw materials from Bakeries (n=26), filters from air conditioning system of Taxis (n=19) and forklifters operating in Waste-Sorting industry (n=16), Swine litter (n=5) were collected.

Samples were extracted and streaked onto malt extract agar (MEA) and in screening agar plates containing Saboraud media supplemented with 4 mg/L itraconazole, 1 mg/L voriconazole, and 0.5 mg/L posaconazole, and incubated at 27 °C for 5 days.<sup>2</sup>

Mucorales-specific assay (Muc18S) real-time PCR (qPCR) was used for Mucorales identification to genus level.<sup>3,4</sup>

## Results

Mucorales prevalence in MEA among settings was: 36% in Waste-sorting, 32% in Bakeries, and 14% in Dwellings. No Mucorales was found in Swine farms and Taxis (Figure 1). Azole-resistant Mucorales isolates were present in 12% of the collected samples (Figure 2). Most resistant Mucorales isolates (n=16) were not susceptible to 1 mg/L voriconazole, with *Mucor* sp. being the most prevalent, followed by *Rhizopus* sp., and *Rhizomucor* sp. (molecular detection by qPCR). Mucorales isolates resistant to 4 mg/L itraconazole (n=4) were also found (Figure 3).

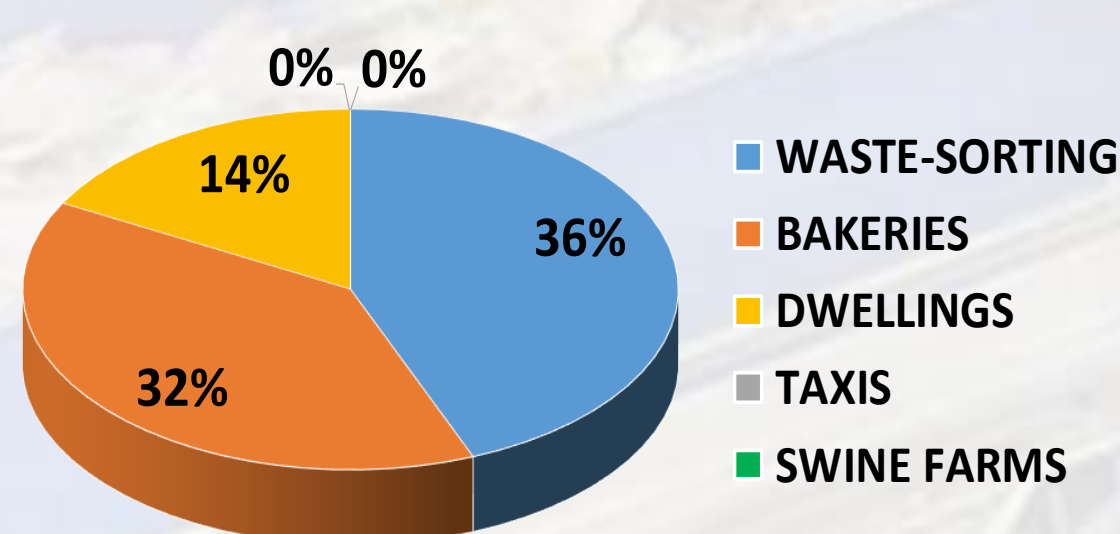


Figure 1 – Mucorales prevalence on occupational settings and dwellings (MEA)

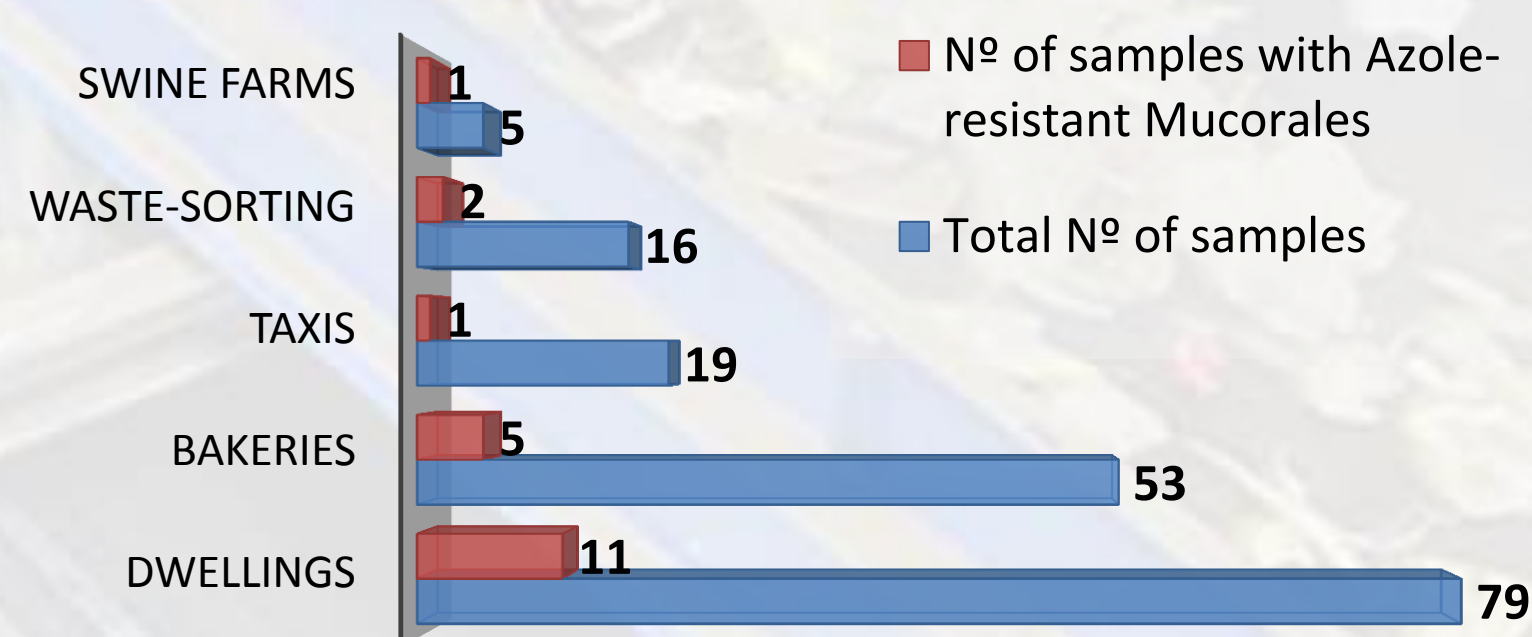


Figure 2 – Number of environmental samples with azole-resistant Mucorales



Figure 3 – Azole-resistant Mucorales genus distribution

## Conclusion

Our data indicate that passive sampling methods (EDC, filters, raw materials) are of high relevance for Mucorales detection in fungal exposure assessments both indoor and in different occupational settings.<sup>2,5,6</sup> Culture based-methods with supplemented media should be applied followed by a more refined molecular tool such as Muc18S assay used in this study for identification to genus level.

## References

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