Sampling airborne fungi in a Hospital counting simultaneously spores over a glass slide and Colony Form Units (CFU) on Petri dishes

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BACKGROUND

The aim of this work was to study the presence of indoor airborne fungi propagules in a hospital using simultaneously two complementary air sampling methodologies: CFU (Colony Forming Unit) analysis and spore count.

METHODS

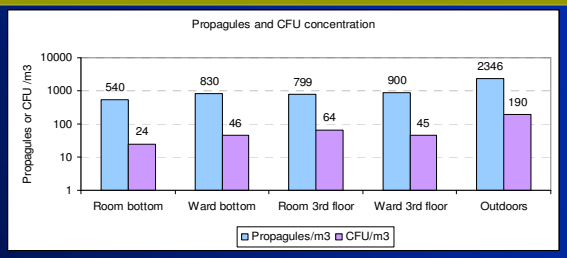
- A periodic sampling was done in our hospital during one year using two personal aerobiologic volumetric portable samplers (Burkard), one of them collecting airborne particles directly onto a glass slide with Petrolatum White as adhesive and, the other collecting particles onto a culture media on Petry dish (SDA, Sabouraud's dextrose agar medium with chloramphenicol).
- Five sampling sites were selected, one outdoors, near the main door of the building, and the others indoors (two on the ground floor and two on the 3rd floor).
- On both floors, an isolated room and a waiting ward were selected to make opportune comparisons and reduce the source of variation.

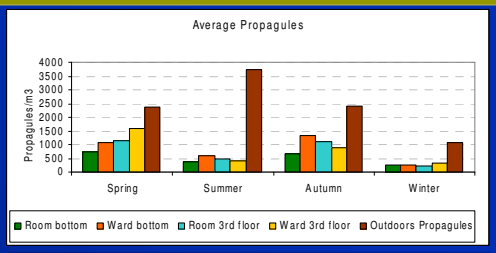
Burkard portable traps

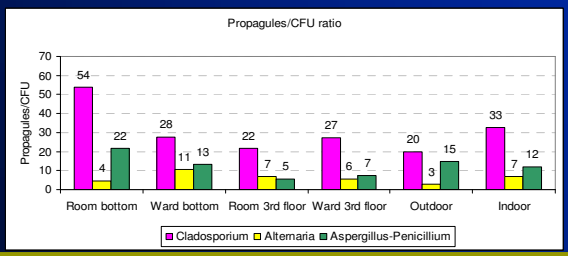
- Both samplers suck air at 10 l/min.
- Sampling was done during 10 min., weekly in spring and fortnightly the rest of the year, between 10:00 to 12:00.

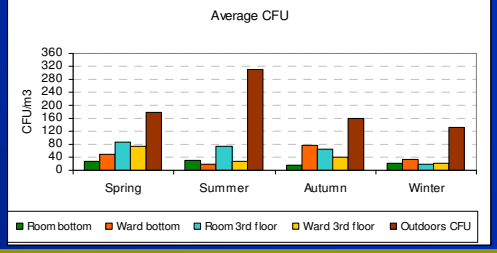
RESULTS

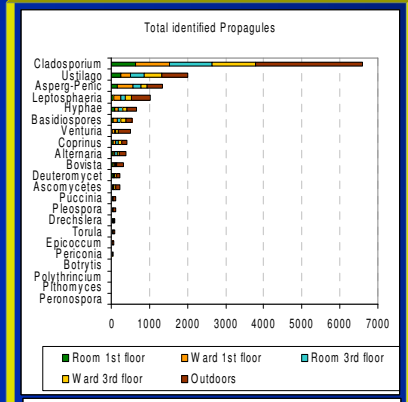
- For the complete study period, the average data were of 1070,7 spores/m3 (0-8200) and 73,8 CFU/m3 (0-560), with a great difference between indoors (767,2 spores/m3 and 44,8 CFU/m3) and outdoors (2346,2 spores/m3 and 1897,7 CFU/m3).
- Both waiting wards show similar results (830,0 and 899,7 spores/m3 and 45,8 and 45,5 CFU/m3).
- For the isolated rooms the results were different, with 540,3 spores/m3 and 24,2 CFU/m3 for the ground floor room and 798,7 spores/m3 and 63,9 CFU/m3 for the 3rd floor. This difference could be due to the way of isolation, a window present on 3rd floor, and the changes suffered on the 3rd floor room due to building works during the study period.
- The rate spores/CFU were 12,5 to 22,3 for indoors and 12,4 for outdoors.
- This rate was different between fungi: Cladosporium shows the highest values and Alternaria the lowest between the main fungi types.

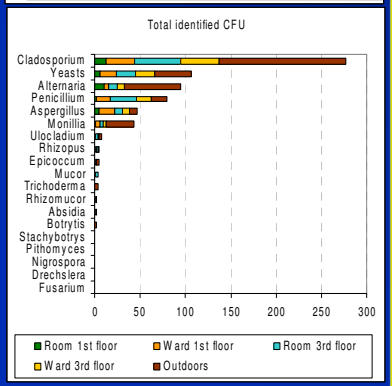


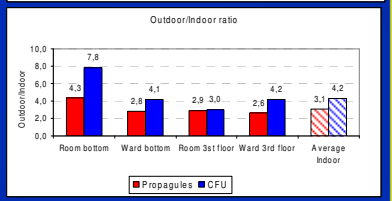












CONCLUSIONS

- Culture sampling for fungus spores shows that only a small fraction of the total airborne spore can be detected by this way, so it is necessary to sample with both methods (counting spores on glass slide and culture media) to obtain a good estimation of the indoor spore concentration.
- Good isolation from the outdoors is the main cause of reduction of indoor spore concentration and the level of the floor seems not be relevant for the results.

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