

Developing a methodology to detect mould hidden behind internal wall insulation.

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Summary

Unintended consequences, such as mould growth, can occur in building constructions such as internally insulated walls. As part of exploratory research, we examined whether air sampling through impaction and culture-based analysis could be used as means to detect interstitial mould. The results extracted suggest that the measurements may be affected by the coverage of mould within confined spaces and the indoor air velocity.

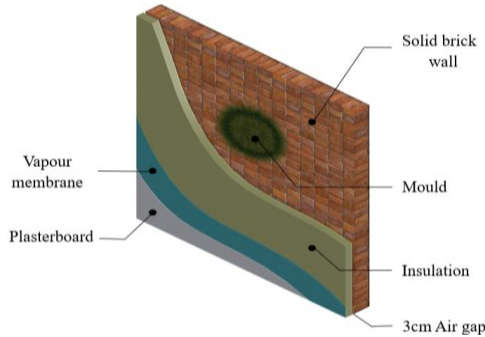


Fig. 1. Illustrations of mould growing within the air gap of an internally insulated wall. (Efthymiopoulos S. (2019). Assessment of mould growth within elements of exterior constructions. Dissertation. UCL)

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Methods

An experimental setup was constructed through a box, to simulate a confined space in a small scale. Cultures of the species *A. versicolor* were used for the experiments. The tests were conducted inside an environmental chamber where the indoor air velocity was controlled by fans.

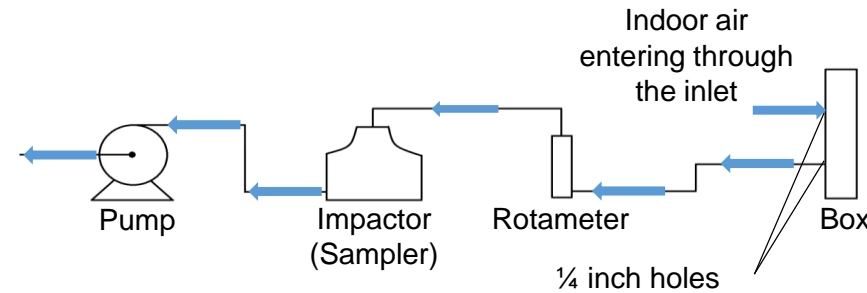


Fig. 2. Schematic representation of the experimental setup

To examine the effect of the mould's biomass to the measurements 4 different cases were examined.

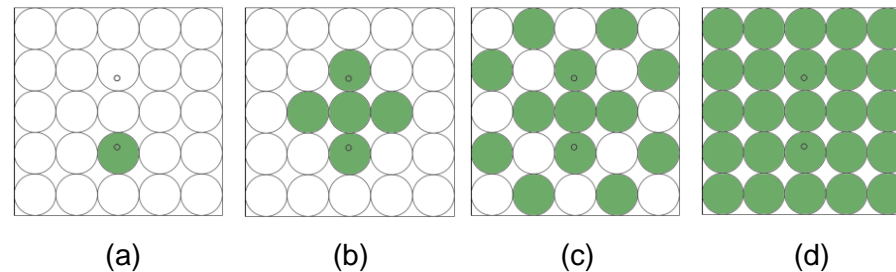


Fig. 3. Illustration of the plates covered with mould in four coverage-related cases examined – (a) Case 1 (1.5% Coverage); (b) Case 2 (7.2% Coverage); (c) Case 3 (18.5% Coverage); (d) Case 4 (35.3% Coverage)

Results

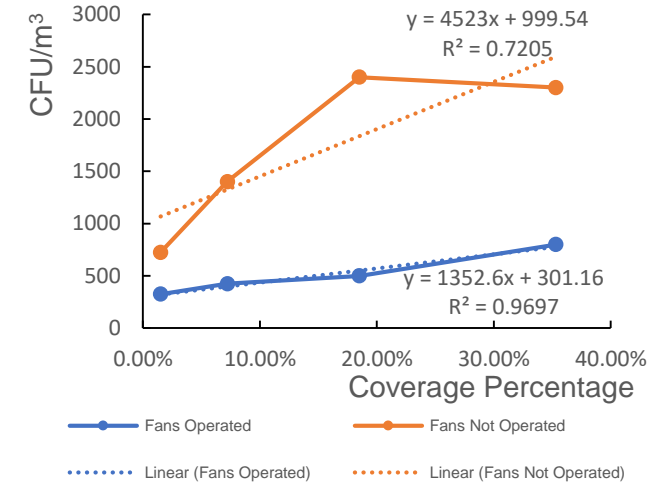


Fig. 4. Comparison of measured mould levels (CFU/m³) for four different coverage cases.

Conclusions

The results indicate the potential existence of a linear relationship between fungal biomass, expressed as coverage percentage, and the CFU values. Indoor air velocity also seems to affect the readings. Repetition of the experiments for the extraction of robust results is highly recommended.

