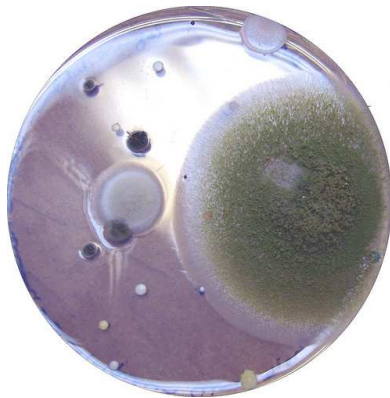


Effect of gaseous chlorine dioxide on indoor microbial contaminants.

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Abstract

Traditional and modern techniques for bioaerosol enumeration were used to evaluate the relative efficiency of gaseous chlorine dioxide (ClO₂) in reducing the indoor microbial contamination under field and laboratory conditions.



The field study was performed in a highly microbially contaminated house, which had had an undetected roof leak for an extended period of time and exhibited large areas of visible microbial growth. Air concentrations of culturable fungi and bacteria, total fungi determined by microscopic count and polymerase chain reaction (PCR) assays, endotoxin, and (1 → 3)-beta-D-glucan were determined before and after the house was tented and treated with ClO₂.

The laboratory study was designed to evaluate the efficiency of ClO₂ treatment against known concentrations of spores of *Aspergillus versicolor* and *Stachybotrys chartarum* on filter paper (surrogate for surface treatment).

These species are commonly found in damp indoor environments and were detected in the field study. Upon analysis of the environmental data from the treated house, it was found that the cultivable bacteria and fungi as well as total count of fungi (as determined by microscopic count and PCR) were decreased at least 85% after the ClO₂ application.

However, microscopic analyses of tape samples collected from surfaces after treatment showed that the fungal structures were still present on surfaces.

There was no statistically significant change in airborne endotoxin and (1 → 3)-beta-D-glucan concentration in the field study.

The laboratory study supported these results and showed a no significant increase in the concentration of (1 → 3)-beta-D-glucan after ClO₂ treatment.

