



## Airborne fungi and bacteria in child daycare centers and the effectiveness of weak acid hypochlorous water on controlling microbes

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### Abstract

A three-week-long biological sampling scheme was conducted in two child daycare centers (CDCCs) in order to investigate in terdiurnal and diurnal variations in indoor airborne microbes as well as the efficiency of weak acid hypochlorous water (WAHW) on disinfecting indoor microbes. During the second week of sampling, WAHW was sprayed using a fogger in the classroom after children had left and before they returned the next morning. An identical cycle of experiments was performed twice in the winter and spring. Without WAHW intervention, the respective mean of the indoor concentrations and I/O ratios were 8732–47 581 CFU m<sup>-3</sup> and 0.96–2.53 for fungi, and 6706–28 998 CFU m<sup>-3</sup> and 1.10–11.92 for bacteria, showing severe bio-contamination in the CDCCs. Moreover, a relatively high level of bacterial pollution was found at noon, whereas a greater fungal pollution could be detected in the morning and at noon. Among five schooldays, the fungal and bacterial pollution may be higher on Monday and on Wednesday, Thursday, and Friday, respectively. Furthermore, with WAHW intervention, the indoor microbial concentrations and I/O ratios were decreased significantly. The reduction of I/O ratios caused by WAHW disinfection was accomplished in the morning for bacteria and in the morning, at noon, and in the afternoon for fungi. In conclusion, this study clearly clarified the risky period during which children may be exposed to hazardous environments, and demonstrated the effectiveness of spraying WAHW the night before on decontaminating indoor airborne microbes on the following day, especially in the case of fungi.

