

TITLE: EVALUATION OF AN IONIZER PROTOTYPE FOR THE FUNGAL CONTAMINATION CONTROL OF THE ENVIRONMENTAL AIR

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ABSTRACT: Environmental air contamination is associated with one of the possible causes of respiratory infections in healthcare environments, especially in immunosuppressed patients. The use of air ionizers, although they are still unfeasible due to costs, has been shown to reduce the microbial load present in the air. Thus, the aim of this study was to evaluate the effect of a low-cost ionizer prototype under development for the fungal contamination control in environmental air. The M Air T[®] equipment (Merck Millipore, Germany) was used to collect 1000L of air per sample and was positioned on a bench 90cm from the floor and 100cm away from the air sampler (119cm from the ionizer to the collector structure of the air sampler). All collections were carried out in an environment with dimensions of 340x295cm, without flow/movement or the presence of people. Plates with Sabouraud Dextrose Agar (BD, Sparks, Le Pont de Claix, France) were coupled to the equipment and used to assess the fungal charge in the air at two different times [group A, before using the ionizer (n=9), and group B, after 24 hours of ionizer operation (n=9)]. After the collection period, the plates were incubated at 23°C for 72 hours. The numbers of colony forming units (CFU) of fungi were counted. Data were tabulated and exported to the Statistical Package for the Social Sciences (SPSS) software, version 20.0. Normality tests (Kolmogorov-Smirnova and Shapiro-Wilk) and T-test were performed to compare the means of the independent samples. For all tests, a significance level of 5% was used. Normality tests indicated normal distribution for both experimental groups. The samples from group A and group B showed mean fungal load in environmental air of 52.9CFU/1000L and 48.7CFU/1000L, respectively. Moreover, there was no statistically significant difference when comparing the groups (p=0.126). In conclusion, the prototype air ionizer under development did not demonstrate a significant reduction in fungal contamination of environmental air.

Keywords: airborne, air ionization, fungi

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