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Effectiveness of a room air disinfection process Airdog X8 in terms of a germ reduction of aerosolized germs in the room air

EXPERT OPINION

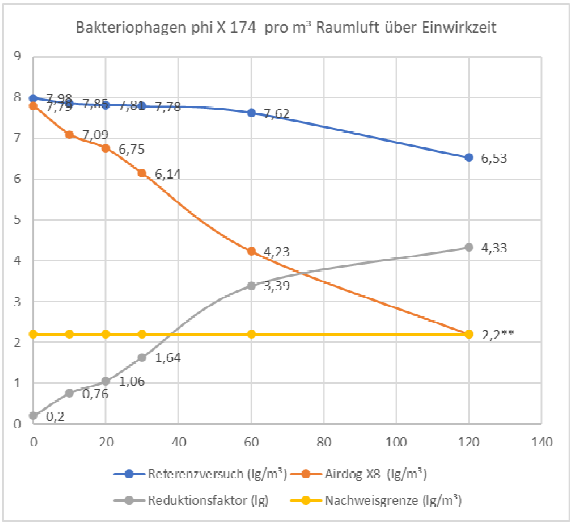
In August 2021, tests were carried out on the device type Airdog X8 with ionic Airdog filter plate technology on the effectiveness of the room air disinfection process were carried out in the test laboratory Hygcen Germany GmbH (test report 2021-2379, 2021-2381; SN 32758 dated 2021-09-07).
Efficacy was tested against bacteriophages (as a surrogate for viral efficacy). The following test set-up was used:
A suspension containing Coliphage *phi X174* (Microviridae, single-stranded DNA, 27 nanometer capsid diameter, uncoated) was nebulized using a precision nebulizer type Typhoon. The present results with respect to the coliphage *phi X174* suggest a similar efficacy of the method against other viruses (at least enveloped viruses, incl. coronaviruses).
Coliphages *phi X174* were determined to be 7.79lg/ml in the germination solution to be nebulized.

In a reference experiment in which the germ suspension was applied without operating the Airdog X8 device under test and then reisolated in room air over a period of two hours, >7.98lg/m³ of coliphage *phi X174* could be reisolated from the air immediately after completion of the nebulization of the germ aerosol. The experimental setup for the actual efficacy test was such that the test room of 75m³ was operated with the Airdog X8 device during application of the bacteriophages at the highest possible air turnover rate (level 1000 m³/h). A Typhoon precision nebulizer was then used to deliver the phage aerosol into the test chamber.

The development of the germ concentration in the air was investigated by means of impinger method at different times after completion of nebulization of the corresponding test germ. For this purpose, air samples of the room air were passed through the impingers at an air flow rate of 125l per 10 minutes for a sampling period of 10 minutes. The liquid contained in the impingers was then quantitatively analyzed for the presence of the test germ. After completion of the nebulization of the germ aerosol, sampling was performed immediately afterwards (T0), after 10, 20, 30, 60 and 120 minutes. These measurements were carried out under the same ambient conditions (63% rel. humidity and 20°C) for both the reference test and the actual efficacy test.

time	control experiment [PfU/m³ air [lg]]	effectiveness test [PfU/m³ air [lg]]	reduction factor
T0	**7.98**	**7.79**	**0.20**
10	**7.85**	**7.09**	**0.76**
20	**7.81**	**6.75**	**1.06**
30	**7.78**	**6.14**	**1.64**
60	**7.62**	**4.23**	**3.39**
120	**6.53**	**<2.20****	**>4.33**

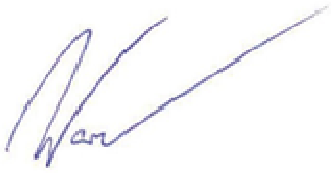
** For the values marked with **, no more test germs were detected in the samples during operation of the Airdog X8. Over the duration of the test, the amount of germs that can be detected in the air decreases (for example, due to drying effects and sinking onto the surfaces) and thus also the detectable reduction rates in relation to this.



Summary and evaluation

After 120 minutes, no more bacteriophages Coliphage *phi X174* could be detected in the room air. The highest reduction rate for the tested device Airdog X8 has been determined under the tested conditions (humidity at the start of the introduction of the aerosol 63% rel. humidity, 20°C, 75m³ room volume, setting of the device to an air turnover rate of 1000m3/h) after one hour with >3.39lg stages.

The present results, with respect to coliphage *phi X174*, also suggest an efficacy of the procedure against other viruses (at least enveloped viruses, including coronaviruses). Thus, when the method is used, effective germ reduction can be achieved directly in the air.



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