Laboratory of Viruses Contaminants of Water and Food

UNIVERSITAT DE BARCELONA

Microbiology, Virology and Biotechnology Section
Departament de Genetics, Microbiology and Statistics
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Summary Report

Evaluation of the efficiency of the air disinfection unit WADU-02, WELLIS (Wellis Co., Ltd.) against Human Respiratory Syncytial Virus under dry conditions

Report nº: 20191212_4

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REPORT Núm. 2019121204

Applicant: RECO PLANT Co., Ltd
Address of Applicant: 3Ho, Ga Dong,174-10, Chilgeori-ro
Eumam-myeon, Seosan-si,
Chungcheongnam-do,
Republic of Korea

Product evaluation
Product Description: Air Disinfection unit
Model number: WADU-02
Brand: WELLIS
Manufacturer: Wellis Co., Ltd.
Issue date: 12/9/2019

Summary

The effectiveness of the WELLIS WADU-02 air disinfection unit for the disinfection of viruses was measured against Human Respiratory Syncytial Virus (RSV). The inactivation or decay of infectious RSV was quantified using cell culture ($TCID_{50}$ assay) and all tests were done in duplicate. Dry viral suspensions were exposed to the disinfection unit in order to test virus stability over time. Control viral suspensions, not exposed to the disinfection unit, were tested in parallel. The disinfection treatment was able to reduce 92% of the initial concentration of RSV after 2 hour of treatment.

Experimental procedure

RSV is an enveloped RNA virus with surface proteins that mediate RSV infection of human airway epithelial cells. RSV is the leading viral cause of acute lower respiratory tract infections, including bronchiolitis and pneumonia, among infants and young children globally. RSV can survive for many hours on hard surfaces such as tables and crib rails. It typically lives on soft surfaces such as tissues and hands for shorter amounts of time. It is usually transmitted through droplets from the cough or sneeze that contact with eyes, nose, or mouth, or by direct contact with a contaminated surface. For this test RSV strain A2 (ATCC® VR-1540TM) was produced in Hep2 cells (ATCC® CCL-23TM).

This experiment was performed for RSV under dry conditions. The air disinfection unit was stored in a metacrilate box (0,064 m3). All experiments were conducted at room temperature. One-hundred microliter droplets were disposed over small pieces of glass, dried at room temperature and placed inside or outside the box (control) as it is shown in picture 1.

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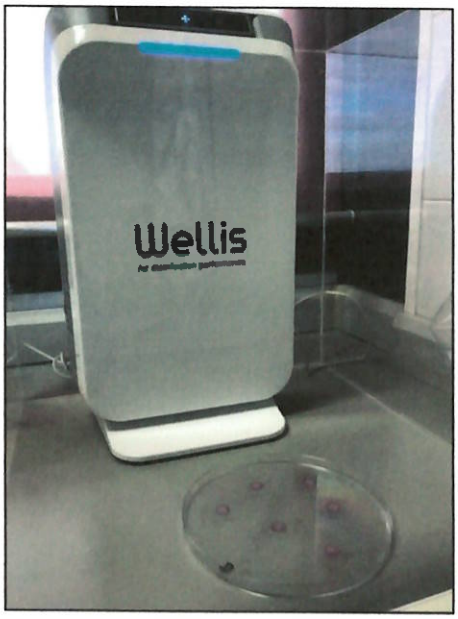

Picture 1: Dry droplets disposed over small glass pieces.

At each testing time viruses were recovered, from the glass surfaces, in culture medium (MEM) and the number of infectious viral particles were quantified by $TCID_{50}$ in Hep2 cells.

The inactivation effectiveness of the air disinfection unit over RSV dry suspensions are summarized in table 1 and figure 1. Viral quantities are expressed in logarithms

	Time	No treatment	Air disinfection unit (ozone + *d*-limomene)	log_{10} decay	% of decay
DRY	0 minut	5,30E+04	5,30E+04		
	30 minut	5,00E+04	1,29E+04	0,56	74%
	1 hour	4,30E+04	1,23E+04	0,78	87%
	2 hour	4,71E+04	9,05E+03	1,71	92%

Table 1: RSV concentration decay over time under dry conditions.

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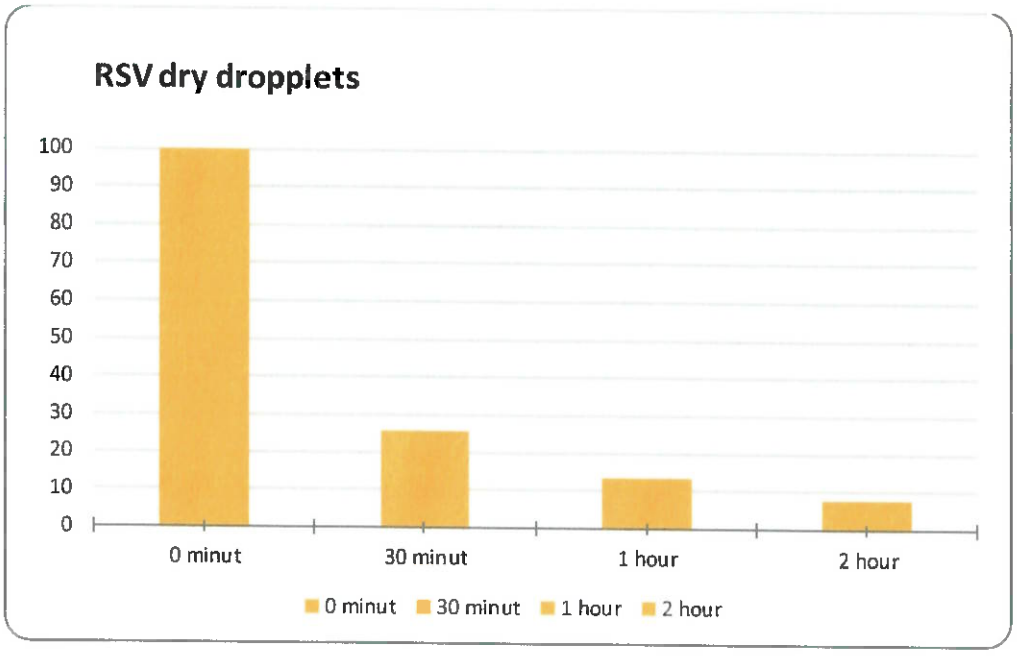

Figure 1: Percentages in RSV concentration over time under dry conditions.

Conclusion

The equipment, significantly reduce the concentration of RSV under dry conditions. This virus presented in 2 hours a total decay of 1,7log$_{10}$. The efficiency of WELLIS WADU-02 on aerosols receiving equivalent doses could be expected to be at least equivalent.

Date: 12-12-2019