

Report on virucidal efficacy of treated paint against human coronavirus OC43 (CoV-OC43) and human enterovirus 71 (EV-A71).

Report reference	SPM/001/2020
Applicant	Smart Paint Manufacturing Sdn Bhd No. 9 & 11, Jalan Indah Gemilang 5, Taman Perindustrian Gemilang, 81800 Ulu Tiram, Johor, Malaysia
Testing Laboratory	Institute of Health & Community Medicine, Universiti Malaysia Sarawak Jalan Datuk Mohd Musa 94300 Kota Samarahan Sarawak Malaysia
Test Start Date	30 August 2020
Report Date	10 September 2020
Test product	Smart Eco-Medi Safeguard +
Test material	1. Treated paint coated glass plates 2. Untreated paint coated glass plates
Test method reference	Modified ISO 21702:2019
Test indicator	Virucidal efficacy
Test virus	1. Human coronavirus OC43 2. Human enterovirus EV-A71
Cell line	LLC-MK2, Vero



TEST RESULTS

Table 1. Experiment Controls

Virus	Sample ID	Virus Titer of Replicates	Mean Virus Titer	Log Reduction	Percent Reduction (%)
CoV-OC43 (Beta Coronavirus)	Positive control	8.4E+06	7.1E+06	N.A.	N.A.
		7.5E+06			
		5.4E+06			
	Negative control ^a	No plaques	N.A.	N.A.	N.A.
		No plaques			
		No plaques			
EV-A71	Positive control	5.7E+05	6.5E+05	N.A.	N.A.
		6.8E+05			
		6.9E+05			
	Negative control ^a	No plaques	N.A.	N.A.	N.A.
		No plaques			
		No plaques			

^aUntreated coated glass plates was used as the negative control

Table 2. Evaluation of Smart Eco-Medi Safeguard +

Virus	Contact Time	Virus Titer of Replicates	Mean Virus Titer	Log Reduction	Percent Reduction (%)
COV-OC43 (Beta Coronavirus)	24 hours	5.7E+03	4.40E+03	3.21	99.94
		2.8E+03			
		4.7E+03			
EV-A71	24 hours	3.2E+02	4.37E+02	3.17	99.93
		4.5E+02			
		5.4E+02			



ASSAY METHODS

1. Test materials were provided by the applicant. The paint coated glass plates measuring 3cm X 3cm were placed in individual sterile disposable petri dishes.
2. An aliquot of 0.1 ml stock of each virus (CoV-OC43 and EV-A71) was spread uniformly over separate 3cm X 3cm of treated and untreated paint coated glass plates. Exposure times of 2 and 24 hours separately were investigated.
3. Post-exposure time, sterile culture media was used to recover remaining virus from the test material. A 10-fold serial dilution in cell culture media, of the recovered virus was prepared (10^0 to 10^{-5}). The serial dilutions were layered onto an 80-90% confluent monolayer of cultured LLC-MK2 cells (for CoV-OC43) and Vero cells (for EV-A71) in separate 24-well plate and incubated at 37°C supplemented with 5% CO₂ for 5-7 days. Plates were observed daily for virus-specific cytopathic effects (CPE) produced by replicating infectious virus.
4. Upon observing CPE (approximately 5-7 days post-infection), cells were fixed with a solution of 4% formaldehyde in PBS and stained with a 0.2% crystal violet solution. Virus plaques were counted from the serial dilution wells to determine the virus titer.

CONCLUSION

Under laboratory conditions, the Smart Eco-Medi Safeguard + treated paint showed virucidal efficacy (for both CoV-OC43 and EV-A71) of greater than 90% after 2 hours exposure which increased to >99.9% after exposure for 24 hours.

No toxic effects were observed on the host cell monolayer due to the untreated paint (negative control).



Report prepared by:

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