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Laboratory Certification
AIHA LAP #183867
CDC Elite since 2009
NY State Legionella Certified #12050
State of TN #03147

Degradation Efficacy Trial of Clean Air Zone BioCAZ Solution Against Infectious Coronavirus.



Product Testing Lab
March 11, 2020

Executive Summary

Overview

- Assured Bio Labs, LLC was contracted by Clean Air Zone (CAZ) to conduct a time series analysis to determine the efficacy of BioCAZ Solution to degrade infectious coronavirus (ATCC# VR-1410, see attached certificate of analysis).
- The starting concentration of coronavirus in the BioCAZ Solution was ~8,300 viral particles per milliliter. The trial was conducted in a six well microplate. Tap water was used as the control. Microplates were incubated at room temperature. The wells were aerated during incubation by gently mixing on a Glass Col multiwell plate mixer at a 10 rpm.
- Samples were collected from microplate wells (400 µl/sample) over a 62 hour period ($T_0 \dots T_6$). Upon collection, each sample was frozen at -86 °C to prevent further biodegradation activity on the virus.
- Once all samples were collected for the trial, the viral RNA was extracted, purified, and analyzed using RT-PCR, nucleic acid quantification methods.

Key Findings

- Coronavirus concentrations were rapidly reduced in BioCAZ Solution microplate wells compared to tap water control wells (see Figure 1).
- BioCAZ Solution immediately began to degrade the coronavirus, with a large drop in viral concentration within 10 minutes of contact time. This data is similar to results seen for BioCAZ Solution flu virus H1N1 trials that Assured Bio Labs conducted previously for CAZ. The 10 minute time point was added because nearly all the flu virus was degraded within 45 minutes in that trial (see document: *Experimental Briefing: Rapid Degradation of Legionella pneumophila and the H1N1 Flu Virus in BioCAZ Solution*).

Conclusion

BioCAZ Solution was highly effective against coronavirus. Initial viral degradation occurred rapidly. A similar degradation curve was observed in flu virus testing (H1N1). The initial rate of degradation was highest during the first 45 minutes of exposure to BioCAZ Solution (see fig 1).

The coronavirus tested in the trials conducted herein were obtained from the American Type Culture Collection (ATCC# VR-1410). The virus was certified to be intact and infectious. The virus is phylogenetically and structurally similar to SARS-CoV-2 the causative agent of COVID-19 infection. Both viruses are classified as Coronaviridae viruses (see attached ATCC description Sheet). Both also cause respiratory disease.

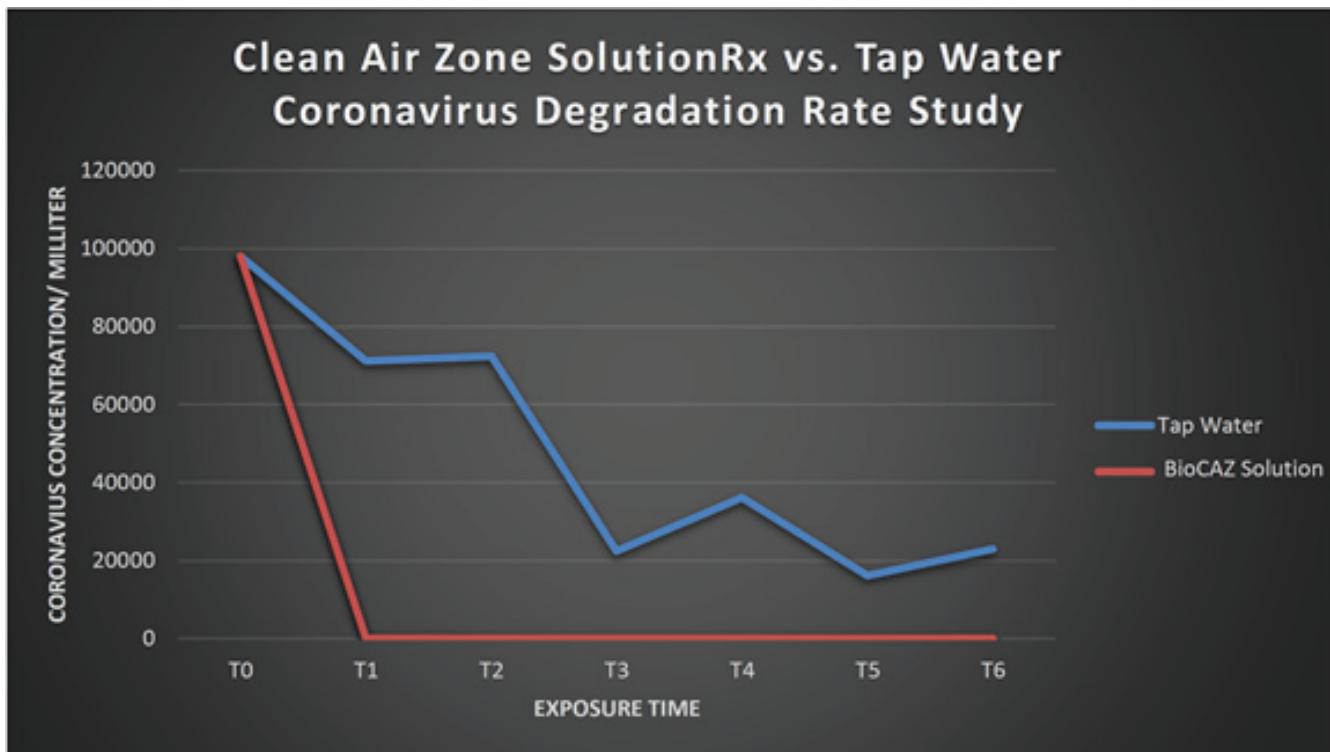


Figure 1. Rapid degradation of coronavirus is observed BioCAZ Solution microplate wells (blue line) within 48 hours following inoculation. The degradation rate of coronavirus in tap water, control wells was appreciable slower (red line).

T0 = Starting Viral Concentration

T1 = 10 minutes of exposure

T2 = 60 minutes of exposure

T3 = 15 hours Exposure

T4 = 23 hours Exposure

T5 = 47 hours Exposure

T6 = 62 hours Exposure

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