

Inactivation of Airborne Viruses using Newly Designed Emitron



Ramakrishna K, Chaya K, Rohit S Mane

Abstract: The objective of the current research is to validate the microbiological quality of Emitron against MS2 phage, Corona virus, bacteria, yeast, and molds. Unimech healthcare designed PMEE based Emitron which is mostly used to reduce the microbial count and virus count in an area. To perform microbiological testing of the Emitron, environmental monitoring was performed for MS2 phage, Corona virus, bacteria, yeast, and molds before and after treatment by settle plate method. Petri plates of sterilized Phage agar, SCDA and PDA media were prepared and exposed for environment monitoring before and after treatment by settle plate method. The phage agar and SCDA plates were incubated at 37°C for 72 hours and PDA plates incubated at 25°C for 5 days. Total of 99% reduction was reported in microbiology lab with respect to the microorganisms after installing Emitron. We can conclude that the Unimech healthcare's Emitron is virus attenuation device so one can use it to purify the air and kill the viruses, bacteria, fungi, and other microbes.

Keywords: Corona virus, Emitron, MS2 phage, PPME

I. INTRODUCTION

The Coronavirus family is a virus coated in a positive charge Spike-Protein capsid while the human cell layer conveys a negative charge. Because of this contrary charge, the S-Protein on the Coronavirus can enter the human cells through the A.C.E.2. receptors and utilizes its cell system like a copier to copy itself [5]. Emitron works by killing its positive charge and crippling the capacity of the Coronavirus particles to append itself to a host cell [2]. The center of this gadget is made of a super-amalgam worked following a time of exploration and produces Photons of extreme focus when energized [1]. After striking strong surfaces like particles noticeable all around, infection particles, tables, seats, dividers, and so on, in a space, these emanate electrons. The electrons get joined to the positive protein on the shell of the Coronavirus, killing its positive charge and keep it from contaminating others. This cycle is classified "Emitron Ionizer Disinfection Unit". This is viable for both surface and

air-borne Coronaviruses [3,5]. Within the sight of Emitron, anybody contacting a formerly tainted surface won't get the infection, giving far more noteworthy assurance and security than some other innovation [6]. It deals with all variations and transformations likewise of the infection and subsequently will likewise shield you from future pandemics and waves brought about by the Coronavirus, assisting you with taking life back to ordinary [4,7]. In the present research we have performed microbiology quality control of invented Emitron to maintain sterile area which will help to understand the efficiency of Emitron.

II. MATERIAL AND METHODS

Environmental monitoring of microbiology lab was performed before and after treatment of Emitron in the area. Before installation of Emitron, microbial count was taken by following plate expose method. After installing Emitron, processed for environmental monitoring. Total of three types of media were used in the testing of Emitron in microbiology lab. Phage agar, SCDA and PDA media were prepared as per standard protocols and sterilized at 121°C for 30 minutes. After sterilization 20 ml of Phage agar, SCDA and PDA media were poured in 90mm petri plates separately and solidified at 45°C for 5 minutes. After solidification, all plates were labelled with location, time, date & day of exposure and time. Then shifted to microbiology lab for environmental monitoring and exposed to lab environment at selected places for 2 hrs. separately. After exposure all plates were incubated for the incubation of microorganisms such as phage agar and SCDA plates at 37°C for 72 hours and PDA plates at 25°C for 5 days. Kept control media plates for each media plate. Isolated microorganisms were submerged for the purification as per standard protocols by referring Bergey's manual of bacteriology [5]. After incubation, microbial colonies were observed, recorded, and percentage reduction was calculated as per following formula.

1. Total microbial count

$$\text{Total Microbial Count} = \frac{\text{Counted Colonies}}{\text{Sample volume}} \times \text{Dilution factor}$$

2. Percentage reduction

$$\text{Percentage reduction} = \frac{\text{Starting value} - \text{final value}}{\text{Starting Value}} \times 100$$

Plate exposure points and their exposing time are mentioned as follows in table 1.

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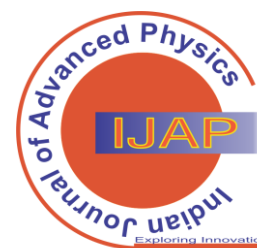
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Table- I: Environmental monitoring points	
Sr. No	Description of test
1.	Naturally occurring bacteria at 2X4, 4X6, 6X8, 8X10, 10X12 for 3hr.
2.	Naturally occurring yeast & mold at 2X4, 4X6, 6X8, 8X10, 10X12 for 3hr.
3.	Naturally occurring MS2 phage at 2X4, 4X6, 6X8, 8X10, 10X12 for 3hr.

III. RESULTS AND DISCUSSION

The pandemic negatively affected all spaces and places. Homes, workplaces, plants, schools, universities, bistros, cafés, parlors, centers, spas, theatres, galleries, lounges, and that's only the tip of the iceberg – were totally influenced [1-4]. Presently at last there's an advancement innovation to secure us and these spaces and places. The world's first demonstrated innovation – the Emitron, an infection constriction gadget that can cripple the whole Coronavirus with up to 99.9% viability in encased spaces. We should take life back to ordinary and typical back to business. In the present research, we have designed new Emitron which is eco-friendly and used to kill the viruses in an area. The Emitron Ionizer Disinfection Unit is a basic fitting and play gadget that can secure you with up to 99.9% adequacy inside from the whole Coronavirus group of infections. Made of prevalent quality parts in an elite office, the gadget likewise arrives in an interesting enemy of viral bundling [6-9]. It consists following parts

1. The Power Cord
2. The User Guide/Product Manual
3. The Warranty Card
4. A couple of stickers
5. A Wall-Mounting Unit
6. Custom Screws, stray pieces
7. And the Device

The gadget utilizes no consumables, channels, synthetic compounds, or emanate any radiation, UV beams, ozone gases. Consequently, making it basically low to no upkeep and 100% safe for people, creatures, Emitron is a Photo Electron Emitter that emits the negatively charged Electrons into the open space [10-12]. It is Revolutionary device that is intended to attenuate the virus especially SARS Cov-2 in the Indoor space. This device can significantly disable the SARS Cov-2 family and thereby reduce the infection spread. It is also called as Air Ionizer. With its charged Ions, it disables or discharge the organic particles and reduce the contamination in the air. PMEE happens when high energy light Photons hits a specific material and thereby such material emits electrons from its Atom. This device uses 15KV of power and 43mA of current passing through specifically designed and patented Cu based super alloy structure with Cone structured Iron-alloy coated conductor electrode, that can generate 26 trillion of electrons per second and thereby it continuously creates a cloud of electrons, called 'Electro-Static Field' into the open area [13]. This Electro-Static filed which is a negative charge, will always attracts positive matter towards it, including virus and thereby it makes them neutralize. It is called neutralization. Due to this effect Virus-Attenuation

happens in SARS-Cov2 virus family. ARS Cov-2 has three types of proteins on its surface viz S Protein, E Protein, M Protein; Each protein has distinctive Spikes like a crown. Coronavirus protrudes from Glycoprotein Membrane cover which is very delicate [5,14]. Under this cell a virus genetic code called RNA structure (Ribonucleic Acid structure) will stay. This virus uses the protein spike to penetrate the body. Protein spike attaches to human cell through ACE2 receptor, and thereby RNA will spread into the human cell and thereby it damages the cell. The RNA will get multiples and thereby viral spread happens. In other words, Protein spikes plays vital role in infecting human. The microbial count specially



Fig. 1. Emitron and their parts designed by Unimech Healthcare

Before treatment with Emitron the microbial count was higher with respect to the bacteria, yeasts, molds and MS2 phage. Naturally occurring bacteria were 4×10^7 and 6×10^9 at 8 feet height & 10 feet distance 2hrs and 4 hrs. respectively; Naturally occurring Yeast & Mold were 4×10^8 and 5×10^7 at 8 feet height & 10 feet distance 2hrs and 4 hrs. respectively; Naturally occurring MS2 phage were 3×10^5 and 2×10^4 at 8 feet height & 10 feet distance 2hrs and 4 hrs. respectively. The results are shown in figure 2, 3, & 4.



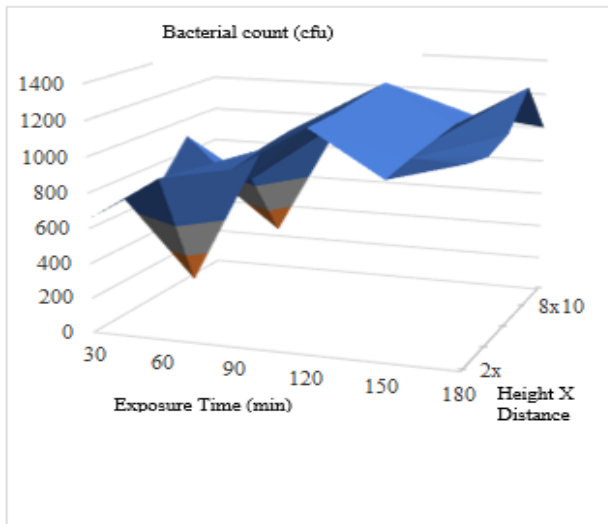


Fig. 2. Bacterial count before treatment at different height and distance

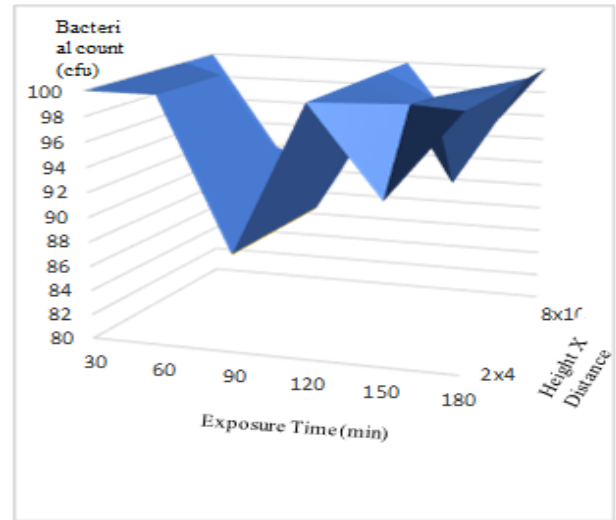


Fig. 5. Bacterial count after treatment with Emitron

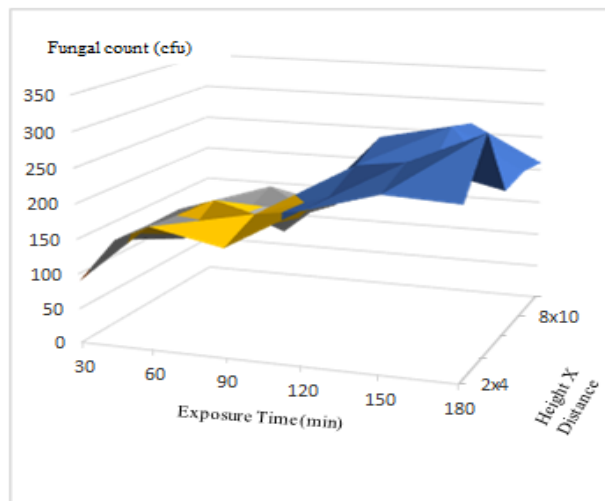


Fig. 3. Fungal count before treatment at different height and distance

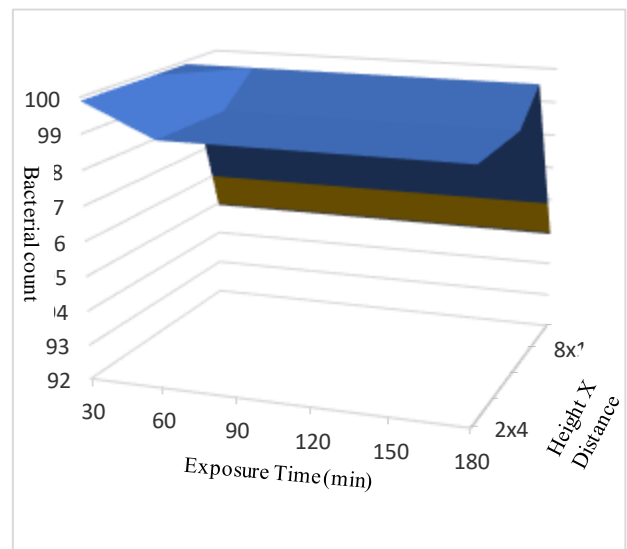


Fig. 6. MS2 phage count after treatment with Emitron

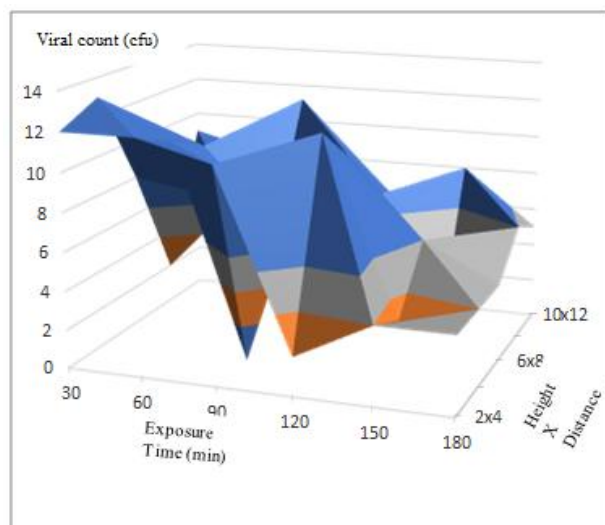


Fig. 4. MS2 phage count before treatment at different height and distance

After treatment with Emitron the microbial count was lesser with respect to the bacteria, yeasts, molds and MS2 phage. Naturally occurring bacteria were 99.98% and 99.95% at 8 feet height & 10 feet distance 2hrs and 4 hrs. respectively; Naturally occurring Yeast & Mold were 99.23% and 99.99% at 8 feet height & 10 feet distance 2hrs and 4 hrs. respectively; Naturally occurring MS2 phage were 92.89% and 97.67% at 8 feet height & 10 feet distance 2hrs and 4 hrs. respectively. The results are shown in figure 5 and 6.

IV. CONCLUSION

The results presented in this research, suggests that the Unimech healthcare’s Emitron is dramatically purifies the air by killing MS2 phage, bacteria, Corona viruses, fungi, and other microbes. It inactivates viruses by the process known as virus attenuation. Therefore, Unimech healthcare’s Emitron is efficient device, and everyone can use in their facility to purify the air.



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AUTHORS PROFILE



Ramakrishna is the Director, Business Development & CFO at Unimech. He thinks and dreams numbers, manages accounting, and audits, and oversees finances at Unimech Aerospace. With close to two decades in the global Pharmaceutical, Energy and Aerospace industries, he is a veteran in Greenfield Projects, scaling it through customer-centric strategies and

has worked for some of the most prestigious names in India and abroad, from Indian Immunologicals Ltd to Aster Telecom, Rolls Royce UK and HAL India. He has held leadership positions, overseeing business planning, execution, designing company budgets, operational setup, company formation, managing finance controls and taxation. Ram loves what he does, is always gearing up for new challenges and is always looking to push boundaries in every new project he undertakes. When he isn't making sense of numbers, he loves to travel, has explored many countries and looking to experience more. He is a multi-linguist and manages his many roles exceptionally well.



Dr. Rohit Shankar Mane is Microbiology Scientist and Lead at URTC, Unimech Healthcare, Bangalore. He has total of six years of microbiology research experience at pharmaceutical, agriculture, and medical research industry. His educational qualification is B.Sc. M.Sc. NET. DPM. PGDFSQM. Ph.D., He is Principal Investigator of DST, DBT and National geography research projects.

He is inventor of ROVE sterilization method. He is fellow of Dr. Babasaheb Ambedkar National Research Fellowship, BARTI, India. He has given Young Scientist award by Microbiologist Society India. He is the 3rd runner up of Citrinin against MCF-7 cell line at Dr. Raghunath Mashelkar Award, India. His project entitled “Chitinase and their antifungal effects” got nominated for GYTI-2018 award under Indian government. He has published 25 books and 56 research papers at International and National level. He is reviewer of 26 International Journals and associate editor of 12 International Journals. His interested research area is Microbiology and Agriculture. He is member of Microbiologist Society of India, American Society of Microbiology, USA, and Canadian Microbiology Society of Canada. He has You Tube channel entitled “Scientist R academy” which is top 6th microbiology educational channel. He is poet, activist and always engaged in microbiology awareness programs.



Dr. Chaya, MSc (Physics), Ph.D., Research scholar from Indian Institute of Science. She worked in different areas of physics. She has published research papers in international journals.