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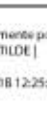
Subdirección General de Sistemas Terrestres

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Dr. MÁRCIA OLIVEIRA

Evaluation of the germicidal activity of the cold plasma bipolar ionization

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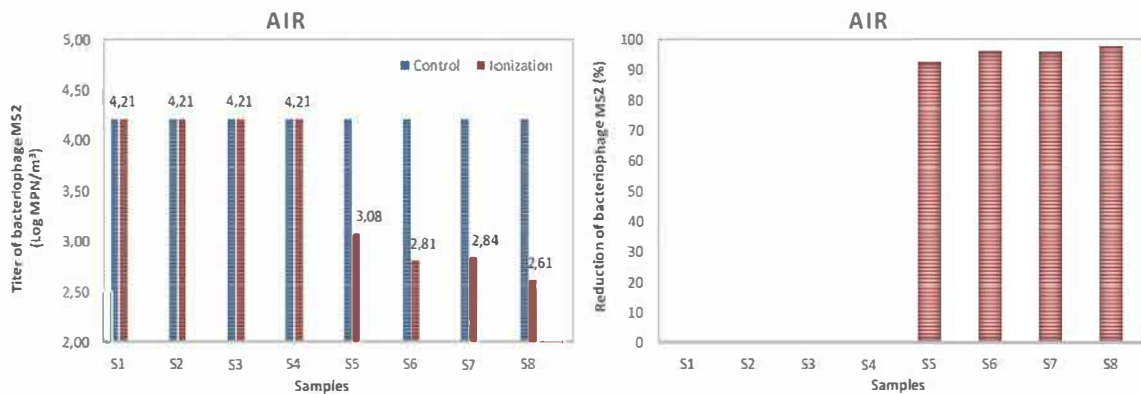
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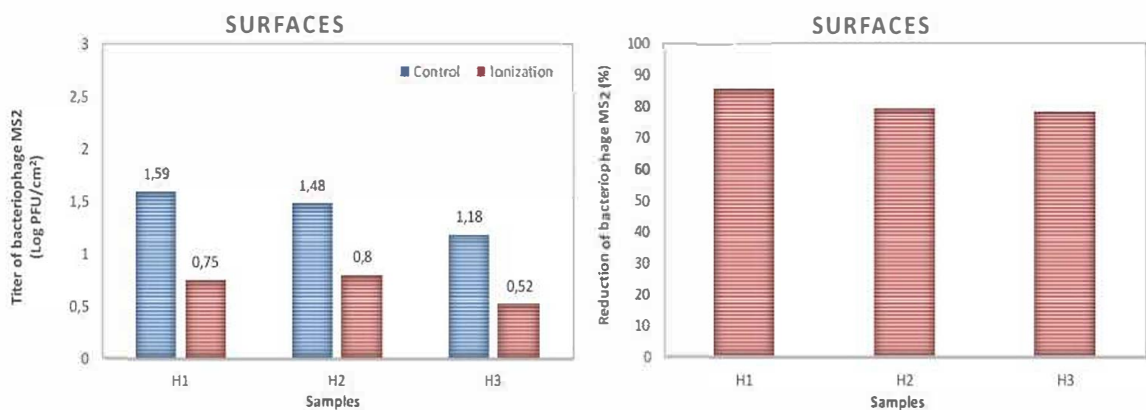
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Test Report Summary

- The test was carried out in a room of the hotel B&B of the T4 airport terminal in Madrid between 4th and 14th of May 2020 with the cooperation of the Biological Defence laboratory of the INTA from the Spanish Ministry of Defence. The test results have been certified by the Director of the INTA, Spanish Ministry of Defence.
- The goal of the test was to measure the effectiveness of the Plasma Air ionisation technique as an effective technology to reduce SARS-CoV-2 surrogate, the bacteriophage MS2, that was nebulised into the test room. The Plasma Air type PA600 (Plasma Air International) equipment was installed in the entrance to the fan coil unit of the supply Air Duct to the test space.
- The bacteriophage MS2 was selected because it belongs to group of biological risk 1 (no risk or very low risk for the individual and the community) (Spanish Royal Decree 664/1997). In addition, the bacteriophage MS2 is often used as a surrogate for airborne virus testing and is an appropriate choice for use as a surrogate human pathogenic virus like SARS-CoV-2.
- A reduction of approximately 2 log units of the bacteriophage was obtained in the air, which corresponds to almost 99% reduction after only 10 min exposure to ionization. Please see the figure below.



- A reduction in the order of 0.70-0.85 log pfu/cm² was obtained on the table, mask and measurement device surfaces (H1-H3 samples), corresponding to almost 80% of reduction. Please see the figure below.



Evaluation of the germicidal activity of the cold plasma bipolar ionization

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- Conclusion: From the results obtained, it can be concluded that the installation of the Plasma Air bipolar cold plasma ionization system has been effective, under the conditions tested, to reduce by approximately 99% the concentration of the bacteriophage MS2 in the air and almost 80% on the surfaces tested in the room, such as table and mask.

Márcia Oliveira, PhD