Inactivation of Aspergillus Fumigatus with Low-Temperature plasma

H. Ghomi [1],S. Zahedi Azad[1], N. Navab Safa[1], Sh. Mohammadi[2] ,Sh. Mirpour[1]

[1] *Laser and Plasma Research Institute, Shahid Beheshti University, Tehran 1983963113, Iran*
[2] *Medicine School, Tarbiat Modaress University,Tehran14115-111, Iran*

E-mail: setarehzahediazad@gmail.com

In the last decades, plasma technology has made an important breakthrough in the treatment of cancer cells and destructive microorganism like bacteria [1]. In this case, we experimented the most common mold infection; Aspergillus Fumigatus, which is common in asthmatic, causing invasive infections in the lung [2].

For this purpose, we exposed our samples to a mesh enhanced dielectric barrier discharge plasma in atmospheric pressure with different exposure times (till 45 seconds). The sample plates were covered with 100µL of Aspergillus Fumigatus suspension with 10^3 CFU/mL concentration. In all cases the voltage amplitude was about 2kV, and the frequency was 16.5 kHz. Figure 1 provides an overview of samples that was exposed to the dielectric barrier discharge. After three days incubation, the treated area was measured.

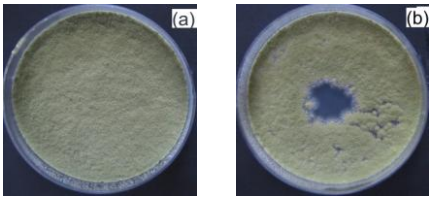

Figure 1: *A comparison of treated area ;(a) control , (b) treated for 25 seconds.*

Figure 2 illustrates the decontaminated area of Aspergillus Fumigatus samples by the DBD plasma as a function of exposure time. It is apparent from the diagram that as the exposure time increases the treated area grows.

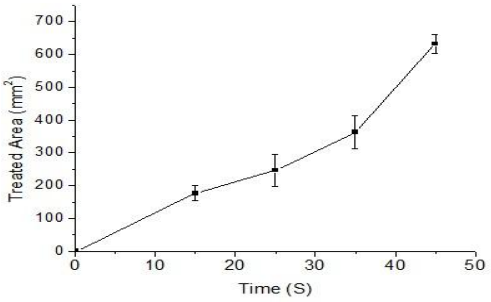

Figure 2: *Treated area of Aspergillus Fumigatus at different exposure times.*

In conclusion, we have studied the effect of DBD plasma on Aspergillus Fumigatus fungi. As it can be seen, by rising the exposure time, the treated area has increased.

References

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