

Treatment of *Paulownia tomentosa* seeds in the low pressure CCP reactor

Saša Lazović^{1,3}, Nevena Puač¹, Dejan Maletić¹, Suzana Živković², Zlatko Giba², Uroš Cvelbar³, Miran Mozetič³, Janez Kovač³, Tatjana Filipič³, Gordana Malović¹ and Zoran Lj. Petrović¹

¹ Institute of Physics, University of Belgrade, Belgrade, 11070, Serbia

² Institute for Biological Research 'Siniša Stanković', University of Belgrade, Belgrade, 11060, Serbia

³ Jozef Stefan Institute, Ljubljana, 1000, Slovenia

E-mail: lazovic@ipb.ac.rs

Previous studies of the effects of non-thermal low pressure plasma on seeds as well as detailed experimental setup can be found elsewhere [1]. In order to learn how plasmas affect human tissues full elucidation of mechanisms of plasma effects on simpler living systems would be helpful. Here we present results of air plasma treatment of *Paulownia tomentosa* seeds in the cylindrical asymmetric CCP reactor at 200 mTorr. Significant improvement of germination is observed and the effect is strongly depending on the duration of plasma exposure. After the treatment XPS and SEM EDXS analysis were performed. From the SEM EDXS images we can see the porous structure of the seeds (see Figure 1).

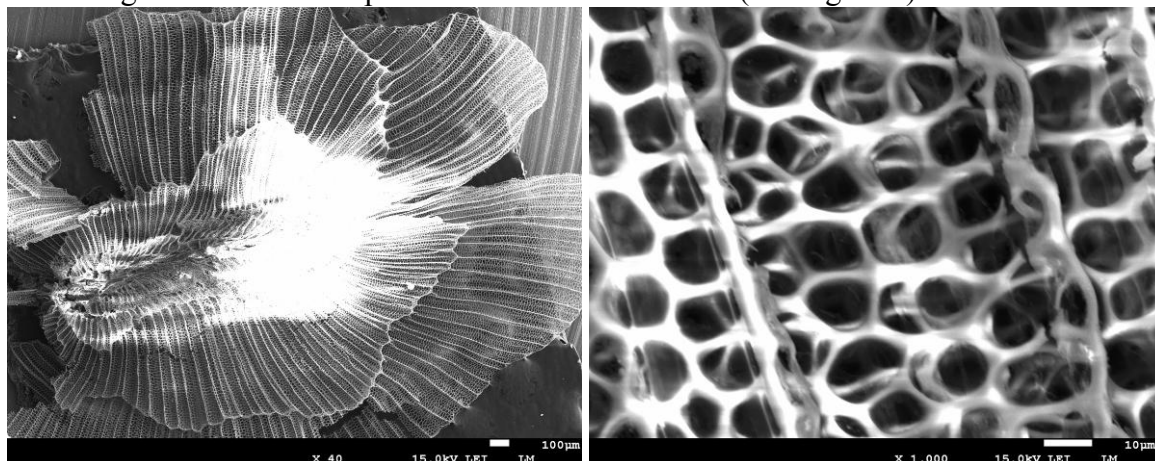


Figure 1: SEM EDXS on *Paulownia tomentosa* seeds (x40 left, x1000 right, 15 kV)

Based on the XPS results we can see that O/C ratio is increasing with the treatment time which leads to the conclusion that the air plasma is inducing the surface oxidation of the seeds. For shorter treatment times (1, 5 min) N concentration at the surface is increased, as well as, potassium concentration which cannot be observed in control samples. The effect on the germination increase can be explained by increase in N and O concentrations on the seed's surface after plasma treatment. Further optimization of the plasma effects on the seed can be achieved by adjusting the power, pressure, gas composition and the distance of the samples from the powered electrode.

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References

- [1] Puač N., Petrović Z.Lj., Živković S., Giba Z., Grubišić D. and Đorđević A.R., Plasma Processes and Polymers, Eds. R. d'Agostino, P. Favia, C. Oehr and M.R. Wertheimer, Wiley (2005) p 193-203,