

Serbian Plant Physiology Society

Institute for Biological Research „Siniša Stanković“, University of Belgrade

19th SYMPOSIUM

of the Serbian Plant Physiology Society

Programme and Abstracts



Banja Vrujci, 13-15 June 2011

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Study of polymer orientation in cell wall of a Serbian spruce (*Picea omorika* (Panč) Purkyne) by polarized FT-IR spectroscopy

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Cell wall can be considered as a nano-composite in which cellulose, lignin and hemicelluloses are interconnected in a specific manner. Structural organisation of the cell wall and related polymers (cellulose, hemicellulose, lignin) is important for both mechanical properties of plants and chemical reactions occurring in the wall space, especially in the response to stress. The cell wall consists of several layers: the outermost primary wall (P), the outer secondary wall (S₁), the middle secondary wall (S₂) and the inner secondary wall (S₃). Due to its relatively larger thickness in relation to the other cell wall layers (80% by weight), the properties of the S₂ layer dominate the properties of the cell wall. Fourier transform infrared (FTIR) microscopy was used to examine the orientation of the main wood polymers in transversal and longitudinal direction of the isolated cell wall of the Serbian spruce branch. Polarised FTIR measurements indicated an orientation of the cellulose microfibrils that was more or less parallel to the longitudinal axis of the cell wall. The hemicelluloses, glucomannan and xylan, appeared to have a close link to the orientation of the cellulose and, thus, an orientation more parallel to the axis of the cell wall. Lignin was found to be organised parallel in relation to the longitudinal fibre axis, and also relative to cellulose.

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Effect of cholic acid treatment on antioxidant status of maize plants

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Young cucumber plants, grown hydroponically for two weeks, were treated by adding cholic acid to the nutrient solution at concentrations 20, 40, 60 and 80 mg dm⁻³, and foliary at concentrations 40 and 80 mg dm⁻³, the control being without cholic acid. After one week, several parameters of antioxidant status were determined in leaves and roots of plants: quantity of ·OH, lipid peroxidation, soluble protein content, glutathione quantity, content of total phenolics and chlorophylls. Quantity of ·OH and lipid peroxidation in the roots and leaves decreased with the increase of cholic acid concentration in nutrient solution. Other parameters mainly decreased in the root and slightly increased or decreased in the leaves depending on the parameter. Obtained results showed that cholic acid treatment had antioxidative effect on maize plants.