

The effect of selected chemical factors that influence the ability of wheat callus to differentiation on physico-chemical properties of cell membranes. II. Changes of electric properties of cell surface

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Electric properties of wheat callus cells modified by chemicals: higher concentration of Ca^{2+} (200, 300 and 400% of control) and 2,4-D (50, 150, 200% of control) as well as callus grown on control nutrient (Musashige-Skoog + 2mg/dm^3 2,4-D) were investigated. Callus previously cultured on control nutrient (3 weeks) was electrophoresed in media of varying Ca^{2+} and 2,4-D concentrations. In these conditions, 2,4-D gave slightly more negative and calcium ions more positive values for the zeta potential in the respect to control. The surface charge density, calculated from the zeta potential, was reduced when concentration of Ca^{2+} increased and the opposite effect was observed in the case of 2,4-D. Adsorption (Γ) and adhesion (A), calculated in the basis of interface tension of the model membrane, reached their higher values for membranes in the media with Ca^{2+} addition, while the lowest values in the presence of 2,4-D were obtained. In the case of 6 weeks, cultured callus in the media with modifiers exhibited other electric properties: the zeta potential was more positive with increasing 2,4-D concentration in medium, and more negative with increasing Ca^{2+} in respect to control. Additionally, correlation between the surface charge density and the sum of phospholipids as well as 18:3/18:2 from phospholipid and galactolipid fraction (data concerned the lipid composition are taken from the part I) was observed. Thus, it seems certain that relations between the callus membrane and medium content in the first minutes of contact may influence later callus growth.