

Relation between the electric surface potential of callus tissue and its histological structure

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The aim of this study was to investigate whether the values of the electric potential of the callus surface are related to its histological structure already in the early stages of induction. The electric potential was measured at the temperature 20°C using standard microelectrode technique. Calli were fixed, embedded in histoplast, cut into 10 µm sections, and stained with standard PAS method combined with Heidenhein's haematoxilin. Observations were done by light microscopy and histological structure of sections was studied. The examined calli showed variable structure. Tissues were classified distinguishing several tissue types, three type of parenchyma and five types of meristematic cells. Callus containing only parenchyma showed small changes in the electric potential, fro 0 to -3 mV. The appearance of meristematic structures near the surface was connected with more negative potentials, fro -10 to -20 mV. The greatest changes in the potentials occurred in calli containing about 20% of this type of tissue. The surface potential of the calli containing meristematic areas deep inside was only about 3 mV lower then that of the parenchyma. It was probably the shielding effect of the surface coat of nondividing cells. The relations between the callus structure and the changes of the potential on its surface show that the electric potential may inform about the structure of the callus tissue. In the paper the probable values of electric potentials, characteristic for particular tissue, have been also presented.