

The Influence of Growth Regulators on Membrane Permeability in Cultures of Winter Wheat Cells

Maria Filek^{a,*}, Jolanta Biesaga-Kościelniak^a, Izabela Marcińska^a,
Ivana Macháčková^b, and Jan Krekule^b

^a Department of Plant Physiology, Polish Academy of Sciences, 30-239 Kraków, Podłużna 3, Poland. Fax: +481 24 25 33 20. E-mail: mariafilek@excite.com

^b Institute of Experimental Botany, Academy of Sciences of the Czech Republic, Rozvojová 135, 160502 Praha 6, Czech Republic

* Author for correspondence and reprint requests

Z. Naturforsch. **59c**, 673–678 (2004); received April 29/June 2, 2004

The effect of plant growth substances (IAA, 2,4-D, zeatin, kinetin, zearalenone) were studied on membrane properties of the cells of embryogenic (E) and non-embryogenic (NE) calli derived from immature inflorescences (inf) or embryos (emb) of winter wheat. Calli initiated from inflorescences show higher permeability. The ion leakage from cells of E calli was higher than from cells of NE calli. Growth regulators were used in concentrations of 2–30 mg/l (about 10–140 μM). All tested growth substances increased ion leakage from NE emb cells, IAA, zeatin and kinetin being most effective. In NE inf cells the effect of growth substances was similar as in NE emb, but much weaker. In E cells of both types (inf and emb) growth substances decreased ion leakage. Changes in the leakage of potassium and calcium ions were similar to those in total ion leakage. The uptake of labelled auxins (IAA and 2,4-D) was higher in NE cells (especially in NE inf) than in E cells. The endogenous level of IAA was higher in E cells than in NE cells and in inf cells than in emb cells. The importance of auxin in determining permeability of cell membranes is discussed.

Key words: Growth Regulators, Cells, Permeability