

Effect of Simple Phenolic Glycosides on the Elongation of *Avena* First Internodes

Phenolic compounds are considered to day as an individual group of plant growth regulators¹. The mechanism of their action might be different²⁻⁴. Phenolic compounds and their derivatives, e.g. glycosides and glucose esters were considered in the past to be waste by-products of plant metabolism. Recently phenolics were found to inhibit or stimulate the oxidative degradation of IAA⁵. Glycosides and glucose esters being the most important bound forms of phenolic compounds in vivo. The enzymes, glycosidases, are supported to be involved in the maintenance of free phenolics pool within the cells. We have reported⁶, that β -glycosidase and IAA-oxidase systems are linked through glycosides and their biochemically active aglycones. To demonstrate such a correlation also in vivo we have studied the effect of simple phenolic glycosides on the elongation of *Avena* coleoptile sections in absence of exogenous IAA.

Methods. The plant material was tested with arbutin and gein (eugenol- β -vicianoside; end concentrations 10^{-3} to $10^{-5}M$) in incubation medium according to HENDERSON and NITSCH⁷. Incubation medium contained phosphate buffer pH 5.5, 2% sucrose and 0.1% Tween 80. In control experiments the mentioned solution with and without 1% glucose was used. The initial length of sections was 2 mm. The growth of the sections was measured after 20 h of incubation at 25°C in the dark.

Results and discussion. The results (average of 4 sets of 60 sections each) are shown in the Table. The results were

evaluated statistically using the *t*-test and were demonstrable at *P* 0,01 level.

Both arbutin and gein in all concentration tested stimulated the elongation of *Avena* coleoptile sections. The glucose in control samples was without any effect which demonstrated that glucose set free from glycosides did not interfere with growth of plant material.

These results correspond to the effects of quinol and eugenol on the purified IAA-oxidase described previously⁶.

Based on our findings the relationship between IAA-oxidase and β -glycosidase have been found not only in vitro, but also in vivo.

Zusammenfassung. Nachweis, dass phenolische Glykoside Arbutin und Gein das Wachstum der *Avena*-Koleoptilen-Schnitte positiv beeinflussen, was auf eine Beziehung dieser Glycoside zu wachstumsregulierenden Mechanismen hinweist.

M. PŠENÁK and G. VIZÁROVÁ

Department of Biochemistry and Microbiology, Faculty of Pharmacy, Comenius University, Kalinčiakova 8, Bratislava (Czechoslovakia), and Institute of Botany, Slovak Academy of Sciences, Department of Plant Physiology, Dúbravská cesta 26, Bratislava (Czechoslovakia), 30 November 1971.

The Effect of arbutine and gein on the oat coleoptile growth

Concentration (M)		Growth (%)
Arbutine	10^{-3}	109,7
	10^{-4}	114,5
	10^{-5}	106,9
Gein	10^{-3}	106,7
	10^{-4}	118,3
	10^{-5}	107,2
Control with glucose (1%)		100

¹ R. TURETSKAYA, V. KEFELI, M. KUTÁČEK, K. VACKOVÁ, N. TSCHUMAKOVSKI and T. KRUPNIKOVA, *Biologia Pl.* 10, 205 (1968).

² E. LIBBERT, S. WICHNER, U. SCHIEWER, H. RISCH and W. KAISER, *Planta* 68, 327 (1966).

³ G. STENLID and K. SADDIK, *Physiologia Pl.* 15, 369 (1962).

⁴ J. W. CORNFORTH, B. MILBORROV, G. RYBACK and P. E. WAREING, *Nature, Lond.* 205, 1269 (1965).

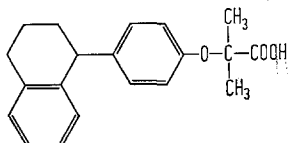
⁵ R. C. HARE, *Bot. Rev.* 30, 129 (1964).

⁶ M. PŠENÁK, A. JINDRA and P. KOVÁCS, *Biologia Pl.* 12, 241 (1970).

⁷ J. H. HENDERSON and J. P. NITSCH, *Nature Lond.* 195, 780 (1962).

Comparative Studies on the Action of the Optical Antipodes of the Hypolipidaemic Aryloxyalkanoic Acid, CH 13 437, on Liver Enzymes of the Rat

2-Methyl-2-[*p*-(1, 2, 3, 4-tetrahydro-1-naphthyl)-phenoxy]-propionic acid (CH 13 437), a compound which belongs to the group of aryloxy-alkanoic acids, is a substance with a strong hypolipidaemic action^{1,2}. In experiments with humans, it shows also a distinct lowering of the blood lipids³⁻⁵. Biochemical investigations of the action on liver metabolism of the rat indicate an inhibition of lipogenesis as the cause of the hypolipidaemic action⁶⁻⁸.



As shown by the Formula, compound CH 13 437 possesses an asymmetric carbon atom in the 1-position of the tetra-

hydronaphthalene ring. Consequently we were interested in comparing the action of the optical antipodes, and for this purpose we examined in rats those liver enzymes of the carbohydrate and lipid metabolism which in earlier

¹ R. HESS and W. L. BENCZE, *Experientia* 24, 418 (1968).

² R. HESS, R. MAIER and W. STÄUBLI, in *Advances in Experimental Medicine and Biology* (Eds. W. L. HOLMES, L. A. CARLSON and R. PAOLETTI, 1969), vol. 4, p. 483.

³ M. M. BEST and C. H. DUNCAN, *J. Atheroscler. Res.* 10, 103 (1969).

⁴ P. ORIENTE, M. MOTOLESE, R. CERQUA and M. MANCINI, *Int. J. clin. Pharmac.* 2, 348 (1969).

⁵ G. HARTMANN and G. FORSTER, *J. Atheroscler. Res.* 10, 235 (1969).

⁶ U. SCHACHT and E. GRANZER, *Biochem. Pharmac.* 19, 2963 (1970).

⁷ M. E. MARAGOUAKIS, *Biochemistry* 9, 413 (1970).

⁸ M. E. MARAGOUAKIS and H. HANKIN, *J. biol. Chem.* 246, 348 (1971).