

β -1,3-Glucooligosaccharide Induced Activation of Four Enzymes Responsible for *N-p*-coumaroyloctopamine Biosynthesis in Potato (*Solanum tuberosum* cv.) Tuber Tissue

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Z. Naturforsch. **55c**, 373-382 (2000); received December 6, 1999

β -1,3-Glucooligosaccharide, *N-p*-Coumaroyloctopamine, *Solanum tuberosum*

Potato tuber disks, when treated with laminarin, a β -1,3-glucooligosaccharide from *Laminaria digitata*, accumulate a hydroxycinnamoyl amide compound, *N-p*-coumaroyloctopamine (*p*-CO). The biosynthesis of *p*-CO was investigated by feeding experiments, in order to show that the precursors of *N-p*-coumaroyl and octopamine moieties of *p*-CO are L-phenylalanine and L-tyrosine, respectively. The treatment of potato tuber tissue with laminarin resulted in elevated activities of four enzymes which are putatively involved in *p*-CO biosynthesis: phenylalanine ammonia lyase (PAL; EC 4.3.1.5), 4-hydroxycinnamic acid:CoA ligase (4CL; EC 6.2.1.12), hydroxycinnamoyl-CoA:tyramine *N*-(hydroxycinnamoyl)transferase (THT; EC 2.3.1.110) and tyrosine decarboxylase (TyrDC; EC 4.1.1.25). Among these, the response of TyrDC was specific to laminarin treatment, thus indicating that the regulation of TyrDC activity is critical for the accumulation of *p*-CO in potato tuber tissue.