sed by *Phoma tracheiphila* (Petri) Kanc. et Gik., we have studied the patterns of polygalacturonase activities in the culture filtrates of this fungus.

Two strains of the fungus, Pt 42 and Pt 55, which differed in pathogeneticity and some cultural characteristics, were tested for their ability to produce pectic enzymes. The two strains were grown on a medium containing 1% pectin as sole carbon source. Culture filtrates were collected by filtration and then partially purified through DEAE-Sepharose. The eluates, containing the polygalacturonase activities, were tested for both enzymatic and phytotoxic activities. Eluates obtained from both strains showed a significant toxic effect on sour orange leaf explants along with a four-fold increase in the polygalacturonase specific activity. Electrolyte leakage was enhanced in leaf explants treated with the eluates. The patterns of polygalacturonase activities were further studied after purification of the DEAE eluate through a CM-Sepharose column.

The isoenzymatic pattern showed the presence of three major enzymatic forms in the Pt 42 strain whereas in the strain Pt 55 four different activities were found. Two enzymatic forms in both strains were chromatographically similar, suggesting that the pathogenicity of the two strains may be related to the excretion of particular polygalacturonase forms. However, we cannot exclude that all enzymatic species are important for plant cell wall degradation.

As polygalacturonases are excreted after their synthesis in the cytosol, it was interesting to find out whether the secreted forms were similar to the cytosolic enzymes. To this end we have partially purified the polygalacturonase activities in the mycelium of both strains in the same conditions used for the secreted forms.

Our results show that for both strains tested the number of enzymatic forms is the same both in the mycelium and in the culture filtrate; however, the chromatographic behaviour of the cytosolic enzymes was different. This is not surprising as excreted proteins are largely processed before their release. However, when the two mycelium isoenzymatic patterns were compared we found that the cytosolic enzymes were similar in both strains. This last finding could be explained by assuming that the two *P. tracheiphila* strains, Pt 42 and Pt 55, contain different processing peptidases in the excreting pathways.

D-GLUCOSAMINE AND N-ACETYL-D-GLUCOSAMINE METABOLISM DURING ELONGATION GROWTH INDUCED BY FUSICOCCIN IN AVENA COLEOPTILE SEGMENTS

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Plant glycoproteins are accumulated in vacuoles, are secreted into the walls, and are incorporated into the membranes of the reticulum endoplasmic, the Golgi apparatus, the nuclear envelope and the plasmamembrane. Many of these glycoproteins have asparagine-N-acetyl-D-glucosamine-linked oligosaccharide chains (Kaushal G.P., Szumilo T., Elbein A.D. 1988. In: *The Biochemistry of Plants*, J. Preiss ed., Academic Press, New York 14:421).

We are interested in understanding the physiological role of the N-linked glycoproteins secreted in the cell-wall during elongation growth. Therefore, as a first approach toward the biosynthesis and characterization of cell-wall glycoproteins we have investigated the metabolism of D-[U-^{14}C]glucosamine and N-acetyl-D-[1-^{14}C] glucosamine during elongation growth induced by Fusicoccin (FC) in coleoptile segments isolated from etiolated avena seedlings (*Avena sativa* L., cv. angelica). Further we have analysed the incorporation of radioactive N-acetyl-D-glucosamine residues in the polymeric material present in either the endomembrane system or the purified cell-walls.

Both D-[U-^{14}C]glucosamine and N-acetyl-D-[1-^{14}C]glucosamine were actively taken up by coleoptile segments and rapidly metabolised according to the following metabolic pathway: D-glucosamine → N-acetyl-D-glucosamine → N-acetyl-D-glucosamine 6-P → N-acetyl-D-glucosamine 1-P → UDP-N-acetyl-D-glucosamine and UDP-N-acetyl-D-galactosamine. All soluble radioactive metabolites were qualitatively and quantitatively analysed by paper electrophoresis and paper chromatography (Piro G., Perotto S., Bonfante-Fasolo P., Dalessandro G., 1988, *J. Plant Physiol.* 132:695). The uptake of either D-[U-^{14}C]glucosamine or N-acetyl-D-[1-^{14}C]glucosamine was stimulated by FC. The metabolic pathway was markedly inhibited by FC in the coleoptiles incubated in the presence of D-[U-^{14}C]glucosamine whereas it was not influenced by FC when N-acetyl-D-[1-^{14}C]glucosamine was used as exogenous substrate. This indicates that FC inhibits the enzyme involved in the acetylation of D-glucosamine. The mechanism of this inhibition has to be established. Nevertheless, it is important to point out that the N-acetyl-D-glucosamine transferase [EC 2.3.1.3] activity is tightly linked to the membranes isolated from avena coleoptile segments (Buffo M., Piro G., Dalessandro G., 1989, *Giorn. Bot. It.* 123, suppl. 1). The radioactive UDP-N-acetyl-D-glucosamine synthesized *in vivo* from both substrates (D-[U-^{14}C] glucosamine and N-acetyl-D-[1-^{14}C]glucosamine) was likely used as glycosyl donor for the synthesis of asparagine-N-acetyl-D-glucosamine-linked oligosaccharide chains. The amount of radioactivity incorporated as N-acetyl-D-glucosamine residues in these glycoproteins present in either the endomembrane system or purified cell-walls was not correlated to the elongation growth induced by FC.

ABNORMAL GROWTH OF LETTUCE AND PEPPER SEEDLINGS TREATED WITH MONODEACETYLFUSICOCCIN

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It is well known that fusicoccin (FC) breaks dormancy of certain seeds, e.g. lettuce, and stimulates seed germination of many plants. Similar effects are also induced by a number of *Fusicoccum amygdali* metabolites structurally related to FC, showing lower toxicity towards plants.

One of these compounds, monodeacetylfusicoccin (MAF) at concentrations of