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SEED- AND SOIL-BORNE PATHOGENS—Discussion Session 1: The Fusaria—A Report of the Pre-Congress Workshop.

PHYSIOLOGY OF DISEASE AND PATHOGENS—Colloquium 4: Phytoalexins

0764

INDUCTION OF PHASEOLLIN AND BROWNING IN PHASEOLUS VULGARIS TISSUE BY MACROMOLECULES SECRETED BY COLLETOTRICHUM LINDEMUTHIANUM. Anne Joyce Anderson and Peter Albersheim. Department of Chemistry, University of Colorado, Boulder, Colo. 80302.

Phaseollin is the key antifungal compound produced in the response of bean (Phaseolus vulgaris) plants to the anthracnose causing fungus Colletotrichum lindemuthianum. We have demonstrated that culture filtrates of C. lindemuthianum produce dark brown lesions on bean hypocotyls. The lesions are formed after 10 to 16 hours incubation at room temperature. The C. lindemuthianum culture filtrates also produce darkening of bean cotyledons. The effect is more rapid than that on hypocotyls, being clearly visible after 4 hours incubation at room temperature. Petroleum ether extracts of the culture filtrate-induced hypocotyl lesions contain phaseollin. Phaseollin was identified as its acetate derivative by combined gas chromatography and mass spectrometry. The factors that are secreted by the fungus that elicit browning and phaseollin production in the bean tissues are stable to autoclaving (121°, 30 minutes) and are sufficiently large to void a Bio-Gel P-150 column. Supported by a grant from the Herman Frasch Foundation and from A.E.C. grant #AT(11-1)-1426.

0765

RISHITIN AND PHYTUBERIN PRODUCTION IN CLONES OF POTATOES VARYING IN DEGREE OF RESISTANCE TO ALTERNARIA SOLANI. D. R. Douglas, G. F. Stallknecht, and J. J. Pavek. USDA-ARS and University of Idaho Cooperating, Branch Experiment Station, Aberdeen, Idaho 83210

Six breeding clones plus Russet Burbank were evaluated for the production of the phytoalexins rishitin and phytuberin in response to infection by Alternaria solani. The clones had previously been evaluated for field resistance to A. solani tuber infection. Three of the clones were considered to be highly susceptible, three highly resistant, and one, Russet Burbank, being intermediate. Whole tubers, which had been in storage for four months, were wounded and inoculated with a spore suspension of A. solani and placed in an incubator at 20°C. A composite of tissue from three tubers was evaluated for terpenoid synthesis by thin-layer chromatography on each day for ten consecutive days after inoculation. The number of color positive spots, as detected by antimony trichloride, varied from 12 to 16, dependent upon the respective clones. Rishitin accumulation was detected 24 hr after inoculation in all clones; however, a higher concentration was noted in the resistant clones as compared to the susceptible clones. The appearance and concentration of phytuberin was quite varied among the respective clones. Clones which were resistant produced detectable amounts of phytuberin within 24 hr after inoculation, whereas the susceptible clones did not produce phytuberin until several days after inoculation. Seven days after inoculation, all clones produced copious amounts of other terpenoids in response to infection. However, certain terpenoids appeared to accumulate more rapidly in the resistant as compared to the susceptible clones.

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PHENOLICS AND PHYTOALEXINES ACCUMULATION ASSOCIATED WITH CHARACTERS OF RESISTANCE IN TOMATOES INFECTED BY PARASITIC FUNGI. - El Khatib A., Alameddine A., Aramouni A., Hassan A., Ravisé A. - Agricultural Research Institute of Lebanon, FANAR, Jdeïdeh el Metn, BEIRUT - LEBANON.

In the tissues of several varieties of tomato having characters of resistance to cryptogamic infections, different phenolics and two substances possessing characters of phytoalexins are accumulated after the penetration of the pathogen (Ravisé A. and Trique B., C.R. Acad. Sc., Paris, 274, Ser. D, 1505 - 1508, 1972; and Cot. Fib. Trop., 27 (3), 295 - 310, 1972). These two compounds inhibit at different concentrations, in vitro, the growth of several parasitic fungi. They also inhibit both activity of pectinolytic enzymes - hydrolases and transeliminases - and of B glucosidases whilst they stimulate that of polyphenoloxidases. The reactions of two varieties resistant to corky root and of another resistant to nematodes, Fusarium and Verticillium were observed in greenhouse and compared with a sensitive variety. The characters of resistance are associated with selective accumulation of phenolics, mainly cinnamic acid derivatives and compounds assimilated to phytoalexins; their concentration seems to reach a maximum between flowering and the beginning of fruits formation. Significant concentrations are still detected at the end of vegetation in the resistant plants.

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