

Papuline, *o*-hydroxynitropapuline and papulinone, assayed at 1.2 mg/ml on trifoliolate bean leaves by the prick-assay method, induced only a slight necrosis of the treated tissues. Therefore, it seems unlikely that they play a major role in the pathogenesis of *P. s. pv. papulans*, but cannot be excluded that their plant growth regulator ability may in some way be related to symptom induction by bacterium.

RELATIONSHIP BETWEEN LIPID METABOLISM AND PHYTOALEXIN PRODUCTION IN POTATO TUBERS AFTER *PHYTO-PHTHORA INFESTANS* INFECTION

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It is well known that arachidonic acid (AA, C_{20:4}, n6) and eicosapentaenoic acid (EPA, C_{20:5}, n3) present in *Phytophthora infestans* elicit phytoalexins (PHY) accumulation (trishitin+lubimin) in potato tuber slices. It has been also reported that the browning of potato tuber slices and the activation of an O₂⁻ generating system appear to be associated with rapid cell death and PHY production. On the other hand, the generation of reactive oxyradicals takes place during the process of both melanoid polymers formation and polyunsaturated fatty acids (PUFA) oxidation by potato 5-lipoxygenase. In the present work we have tested on potato tuber slices different PUFA at different concentrations from 0.5 to 500 µg/slice. In addition, C_{22:1} methyl ester, C_{20:4} methyl ester, triarachidonin (TriAA), L- α -phosphatidylcholine, β -arachidonyl- γ -stearoyl (PAS), 5-hydroperoxyeicosatetraenoic acid (5-HPETE), 5-hydroxyeicosatetraenoic acid (5-HETE) and arachidonyl alcohol (AAL) were also tested. We have also investigated on potato tuber slices the effect on PHY accumulation and browning process up to 4 days of compounds capable of affecting both browning and oxyradical generation such as a) caffeic acid (CA) (20-100 µg), L-DOPA (DP) (20-100 µg); b) superoxide dismutase (SOD) (100 U.I.), catalase (CAT) (100 U.I.); c) phenylthiourea (20-50 µg).

Results. A) As expected, AA and EPA were the most potent elicitors. Significant PHY accumulation started from 20-25 µg/slice of the two PUFA and increased up to 500 µg/slice. C_{22:1}, n3, C_{22:4}, n6 and C_{20:1}, n6 yielded good levels of PHY at concentrations over 100 µg/slice. The other PUFA were largely less active elicitors. B) No activity was observed in response to AAL or TriAA, while methyl-AA and PAS elicited PHY accumulation even more efficiently than AA on a per mole fatty acid basis, following hydrolysis to free AA (by the acyl hydrolases of potato tuber). C) Following application to slices, there was a rapid decline of each recoverable PUFA and in AAL, without incorporation into lipid fractions of potato tuber slices. D) Potato 5-lipoxygenases rapidly metabolized each added free PUFA, but the Δ 5 double bond present in AA and EPA appeared to be very important in PHY induction. In fact, 5-HPETE (but not its reduced derivative 5-HETE) was a very efficient elicitor. E) Orthodiphenols CA and DP were rapidly degraded by potato

phenoloxidases. They produced a significant increase in browning of slices without affecting PHY accumulation. F) Oxyradicals scavengers enzymes SOD and CAT slightly reduced the browning and only after 1 day of incubation. G) Phenylthiourea, a strong irreversible inhibitor of phenoloxidases, fully inhibited browning at 20 µg/slice without affecting PHY accumulation.

This clearly indicates that the metabolic events leading to PHY accumulation and to browning process are not necessarily interdependent.

BROMINATED METABOLITES OF *PSEUDOMONAS SYRINGAE* PV. *SYRINGAE*

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The B-350 syringomycin and the B-427 syringotoxin producing strains of *Pseudomonas syringae* pv. *syringae* have been grown in the SMR-C chemically defined medium of Surico, Lavermicocca and Iacobellis (Phytopath. Medit., 27, 163-168, 1988), in which histidine chloride has been replaced by histidine base and calcium chloride by calcium nitrate. On addition of sodium bromide to the above medium some new substances were formed (HPLC), in particular, with strain B-350 the halogen-free syringomycin-E, and the bromine containing syringomycin-E and -G, and with strain B-427 the halogen-free syringotoxin and its bromine derivative (FAB-MS). In the absence of halogenides the amount of halogen-free metabolites was further increased while the halogenated derivatives were not detectable.

Data concerning the chemical characterization and the biological activity of the above metabolites will be reported.

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PRELIMINARY RESULTS ON THE PRESENCE OF SYRINGOMYCIN-LIKE SUBSTANCES IN BEAN TISSUES INFECTED BY *PSEUDOMONAS SYRINGAE* PV. *SYRINGAE*

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Syringomycin (SR), a phytotoxin whose structure has recently been elucidated, has been reported to contribute significantly to the virulence of the different ecotypes of *Pseudomonas syringae* pv. *syringae*. Although its presence in the diseased and