

## **The effects of aspirin and polyacrylic acid on pathogenesis-related protein induction and localised and systemic tobacco mosaic virus infection**

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Injection of leaves of *Nicotiana tabacum* cv. Xanthi-nc with aspirin resulted in the induction of protein PR-1a and resistance to tobacco mosaic virus (TMV), the levels of both being dependent upon the concentration of aspirin used.

Aspirin treatment of leaves of cv. Samsun induced PRs and reduced the amount of TMV accumulated 7 days after inoculation. Polyacrylic acid (PA) did not induce PRs and caused little or no reduction in the amount of TMV accumulated.

In cv. Samsun NN at 32 °C aspirin induced the PRs and reduced the spread of TMV to surrounding tissue as measured by the size of lesions produced on subsequent transfer to 20 °C. PA did not induce PRs in 'Samsun NN' and had no effect on the spread of TMV. In cv. Xanthi-nc at 32 °C both aspirin and PA induced PRs and reduced the spread of TMV.

This work was done in collaboration with J.F. Antoniwi and J.P. Carr (Bioschemistry Department) and R.D. Woods (Plant Pathology Department, Rothamsted Experimental Station).

## **Induction of soluble (b) proteins by *Peronospora tabacina* in *Nicotianae* treated with polyacrylic acid or fungicides and in untreated *Nicotianae***

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Several varieties or species of *Nicotiana* were artificially or naturally contaminated with *Peronospora tabacina* A. at various stages of growth: 10-to 20-days-old seedlings (cotyledon stage), 10-weeks-old greenhouse-grown plants and field-grown plants. Their soluble proteins were extracted and analysed by electrophoresis on polyacrylamide gel.

b-Proteins were evident in healthy plants: on the one hand, in seedlings exclusively fed with magnesium nitrate ( $Mg^{2+}$ ), and, on the other hand, in fully-grown field plants once flowering and senescence processes had been initiated. At all three stages of growth studied, *P. tabacina* contamination led to the formation of b-proteins or an increase in their quantity if they had already been induced. Their presence in healthy or *P. tabacina*-contaminated tobacco's did not seem to be related to specific resistance genes as they were detected in both susceptible and resistant reactions.

The presence of relatively large quantities of b-proteins in field-grown plants did not prevent the mold from causing extensive damage. Although b-proteins were produced after treatment with the otherwise very effective fungicide Metalaxyl, polyacrylic acid, a well-known inducer of b-proteins, gave no protection against the pathogen; in  $Mg^{2+}$ -treated seedlings it inhibited the expression of the resistance genes and thus favoured development of the pathogen. These results suggest that b-proteins are not directly involved in the resistance mechanism to *P. tabacina*.