Phylogenetic aspects of pathogenesis-related (b) proteins

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Biochemical analysis of phylogenetic relationships in plant genera and species has recently been developed as a way for studying evolution in plants. The use of b-proteins for such analyses has several advantages: stable and reproducible protein patterns, a specific variability inherited by simple Mendelian laws, a readily available molecular and genetic approach. Up to now such investigations have only been extensively undertaken in *Nicotiana* species: seven different b-proteins have been recognized in about 15 species belonging to the three main subgenera (1).

Similar genetic analyses have also been made using leaf peroxydase banding patterns (2), and chloroplast-DNA restriction patterns (3). Results from the three methods of analysis show some convergence and broadly confirm the previous classification for species in the genus *Nicotiana* established by Goodspeed (4). The Australian group (subgenus *suaveolentes)* seems to be characterized by the proteins b_{1}·· and b_2 (belonging to the same serological group (5)) and occurrence of b_2 in *N. tomentosiformis* and *N. rustica* supports the maternal filiation suggested by the work on chloroplast-DNA patterns. The hypothetical origin of tobacco, *(N. tabacum = N. sylvestris* × *N. tomentosiformis* amphidiploïd) suggested by many workers (cf.1) is also supported by the results of the b-protein analyses; three of the main b-proteins (b_1, b_2, and b_3) found in tobacco, probably come from the two hypothetical parents: b_2 from *N. tomentosiformis*, b_1 and b_3 from the ancestral *N. sylvestris.*

Although available results and data are still incomplete, it appears from these studies that b-proteins could be usefully employed in phylogenetic investigations.

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(3) Kung, S.D., Zhu, Y.S. & Shen, G.F., 1982. *Nicotiana* chloroplast genome III. Chloroplast DNA evolution. Theor. Appl. Gen. 61: 73-79.
(4) Goodspeed, T.H., 1954. The genus *Nicotiana*. Chronica Botanica Comp., Waltham, Mass., USA, 536 pp.
(5) Ahl, P., 1983. Aspects génétiques et moléculaires de la résistance (RH) chez les *Nicotiana.* PhD Thesis, University of Geneva, Switzerland.

A new potential for enhancing resistance to tobacco mosaic virus in Nicotiana species

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Crosses between *Nicotiana glutinosa* and *N. debneyi* produce hybrids which are highly resistant to tobacco mosaic virus (TMV) and to tobacco necrosis virus (TNV). Healthy plants of these hybrids synthesize a protein (b_{1}··) which is not present in the healthy parents, but whose appearance can be induced in the parents by infection with