HIURA, U.; 1962: Hybridization between varieties of *Erysiphe graminis*. Phytopathology **52**, 664-666.

KLEMPKA, K. C.; MEREDITH, C. P.; SALL, M. S.; 1984: Dual culture of grape powdery mildew (*Uncinula necator* BURR.) on its host (*Vitis vinifera* L.). Amer. J. Enol. Viticult. **35**, 170-174.

LEE, T. C.; WICKS, T.; 1982: Dual culture of *Plasmopara viticola* and grapevine and its application to systemic fungicide evaluation. Plant Dis. **66**, 308-310.

MAGAREY, P. A.; WICKS, T. J.; 1986: A new spore type for grapevine powdery mildew. Austral. Grapegrower Winemaker (No. 268), 92-94.

MOREL, G.; 1948: Recherches sur la culture associée de parasites obligatoires et de tissus végétaux. Ann. Epiphyt. **14**, 85-87.

PEARSON, R. C.; GADOURY, D. M.; 1987: Cleistothecia, the source of primary inoculum for grape powdery mildew in New York. Phytopathology **77**, 1509-1514.

POSPISILOVA, D.; 1978: Sensibilité des cépages de *Vitis vinifera* à l'oïdium de la vigne (*Uncinula necator* SCHW. BURR.). IIe Symp. Intern. Amélior. Vigne, Bordeaux, 14-18 juin 1977. Génétique et Amélioration de la Vigne, 251-257, INRA, Paris.

SALL, M. A.; WRYSINSKI, J.; 1982: Perennation of powdery mildew in buds of grapevines. Plant Dis. **66**, 678-679.

SMITH, G. G.; 1970: Production of powdery mildew cleistocarps in a controlled environment. Trans. Brit. Mycol. Soc. **55**, 355-365.

STEVA, H.; CARTOLARO, P.; CLERJEAU, M.; LAFON, R.; GOMES DA SILVA, M. T.; 1988: Une résistance de l'oïdium au Portugal. Phytoma (No. 402), 49-50.

VAN DER SPUY, J. E.; MATTHEE, F. N.; 1977: Overwintering of the oidium stage of *Uncinula necator* in the buds of the grapevine. Plant Dis. Rep. **61**, 612-615.

Phenol and silica incrusts in epidermal cells of *Vitis* spp. as a general defence mechanism

R. BLAICH, C. HEINTZ, G. HOOS and R. WIND

Bundesforschungsanstalt für Rebenzüchtung Geilweilerhof, D-6741 Siebeldingen, F. R. Germany

A b s t r a c t : The host-parasite interactions between the grapevine *Vitis vinifera*, powdery mildew *Uncinula necator (Oidium tuckeri)* and grey mold *Botrytis cinerea* were studied by light microscopy-histochemistry and electron microscopy.

Chemical defence mechanism involves incrusting of the walls of the infected cell and of neighbouring cells with phenolic substances associated with a cell wall bound peroxidase activity. This indicates the formation of lignin-like components. In addition, silica deposits were observed in whole cell walls or parts of them. Pure, mechanically resistant silica skeletons remained after a treatment with conc. $H_2SO_4 + H_2O_2$ at 400 °C and washing with conc. HCl. They consisted of groups of 1-20 cells of the upper epidermis with adhering parts of the corresponding palisade cells or of the lower epidermis (including stomatal cells) with adhering spongy parenchyma. Not only cell walls but also wrinkles of the upper epidermis, defence papillae and fungal haustoria were silicified. Silica accumulations were greater in resistant than susceptible cultivars.

These reactions are induced not only by parasitic fungi but also by mechanical damage of the leaf. Our studies corroborate observations in other host-parasite systems and indicate the existence of an unspecific, fast-reacting mechanism serving as an early defence line which allows the activation of slower, more specific defence reactions.