Proceedings of the 7th Hungarian Congress on Plant Physiology, 2002
S3-P02

Volume 46(3-4):143, 2002
Acta Biologica Szegediensis
http://www.sci.u-szeged.hu/ABS

Induction of lipoxygenase activity in pepper leaves infected by tobamoviruses

Gábor Gullner*, István Tóbiás

Plant Protection Institute, Hungarian Academy of Sciences, Budapest, Hungary

Infection of plants by phytopathogenic viruses often results in oxidative stress in the infected leaves, which leads to irreversible damage of cellular membranes (lipid peroxidation) and to the appearance of visible necrotic disease symptoms. The hypersensitive reaction (HR), the rapid cell death at the pathogen entry sites is a characteristic feature of incompatible plant-pathogen interactions. Lipoxygenase enzymes (LOX, EC 1.13.11.12.) that catalyze the formation of hydroperoxy derivatives of polyunsaturated fatty acids, were also shown to participate in HR. The hydroperoxy fatty acids produced by LOX enzymes are deleterious to membrane functions and their accumulation can lead to necrotic damage. On the other hand, they are also key intermediates in the octadecanoid signalling pathway and in other important metabolic processes. In the present study the induction of LOX activity was followed in near-isogenic pepper (*Capsicum annuum* L.) plants. Cultivars containing the L^1, L^3 or L^4 resistance genes and a susceptible host (L^+) were inoculated with tobamoviruses overcoming neither, one, two or all of the resistance genes. LOX activity was induced in case of incompatible host-virus relationships (L^1 - TMV / Fe, L^3 - ToMV / Ob, L^4 - ToMV / OB and L^4 - PMMV), but no significant changes were observed in case of compatible host-virus interactions (L^+ - TMV / Fe, L^+ - ToMV / Ob, L^1 - ToMV / Ob and L^3 - PMMV). The increase of LOX activity coincided with the appearance of visible local necrotic lesions. The specific induction of LOX in the incompatible plant-virus combinations suggested that LOX may be involved in the development of resistance against tobamo-viruses.

*Corresponding author. E-mail: ggull@nki.hu