Abstract:

Within their natural environment, plants are subjected to a combination of stress conditions. Since potential interactions between signal pathways, plants respond to multiple stresses differently from how they do to individual stresses, activating a specific programme. Heat shock proteins (HSP70) overexpressed after heat shock influence the viral infection. On one side HSP70 can participate on refolding of aggregated or partially denaturated proteins, on the other side HSP70 can interact with viral proteins and facilitate propagation of viral replication complexes.

In this work the effect of heat shock (42°C, 2. hours) applied before or after the inoculation of plants *Nicotiana tabacum* L. cv. Petit Havana SR1 with Potato virus Y on viral infection was detected. This effect was studied in two biological experiments. The amount of coat protein of PVYNTN and protein HSP70 were detected simultaneously with the activity assays of Hatch-Slack cycle enzymes, glycosidases and peroxidase.

Both experimental approaches (heat shock applied before or after the inoculation by PVYNTN) enhanced amount of the virus and in the 2nd experiment it accelerated infection development. Immediately after application of heat shock the amount of HSP70 was increased. The enhancement of HSP70 by viral infection occurred later (14.-21. days after inoculation). Activities of Hatch-Slack enzymes, glycosidases and peroxidase were increased in both, plants exposed to combination of stress and plants only inoculated by PVYNTN, respectively. Small differences between these enzyme activities indicate that the synergic effect was not probably involved in particular signal pathways of defense responses. (In czech)

Keywords:

combination of stress factors, heat shock, HSP70, Potato virus Y, Hatch-Slack cycle enzymes, glycosidases, peroxidase