

## Abstract

Plants are continuously exposed to various stress conditions. Being sessile, they are not able to escape from adverse conditions. Therefore, they have developed specific defence mechanisms. Most studies focus on plant responses to a single type of stress. However, plants in nature must cope with a variety of stresses at the same time. In this work, the effects of heat shock on the interaction of tobacco (*Nicotiana tabacum* L.) with the *Potato virus Y* (PVY) were investigated. Obviously, heat stress is associated with the synthesis of Hsp70 protein, which has many important functions alleviating adverse effects of stress conditions (e.g. Hsp70 participates in refolding or degradation of damaged proteins and protein synthesis *de novo*). The effect of Hsp70 during viral infection is still not fully understood, some studies revealed Hsp70 as a part of viral multiplication and transport processes in plant. In the first experiment performed in this work, higher levels of PVY<sup>NTN</sup> virus was found in tobacco plants that have been exposed to heat shock after inoculation than in plants only infected. The amount of the virus corresponded with the amount of Hsp70 protein detected immunochemically using a specific antibody. It seems that the plant response to combination of heat stress with viral infection is a complex process that depends not only on the appropriate timing of the heat shock, but also on the nature and severity of the viral infection. Therefore, in this study the general case of induction of Hsp70 caused by salt stress was simultaneously monitored in cucumber (*Cucumis sativa* L.). The amount of Hsp70 protein in the leaves of stressed plants has been gradually increasing during salt stress conditions.