

# Plant Genomics

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## Induced defense responses in hop-*Verticillium* interactions as revealed by proteomic and transcriptomic analysis

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*Verticillium* wilt caused by soil borne vascular tissue infecting species of the *Verticillium* genus is a devastating disease in many crops. Host resistance and phytosanitary measures are the best options for controlling the disease so elucidation of plant wilt resistance can undoubtedly enhance resistance breeding. We study *Verticillium* wilt in hop caused by a highly virulent strain of *V. nonalfalfae*, which has recently become a serious threat to hop production in Europe. The first QTL for hop resistance against *Verticillium* wilt has been identified, opening up possibilities for investigation of the genetic basis of hop resistance source, as well as markers development and their exploitation in MAS resistant breeding. Transcriptomics and proteomics were employed in a time course experiment comparing infected and control plants of resistant and susceptible hop cultivars to characterize hop-*Verticillium* interactions. The expression patterns of most studied genes and the decline of fungal biomass in the infected resistant cultivar suggest that the defense response in the resistant cultivar is strong enough at 20 dpi to restrict further fungus colonization. The results so far have shown strong expression of genes encoding PR proteins in both interactions, strong up regulation of genes implicated in ubiquitination and vesicle trafficking in the incompatible interaction and their down regulation in susceptible plants. Additionally, the identification and high abundance of two mannose/glucose specific lectin isoforms and dehydrins present only in the roots of the resistant cultivar implies a putative function of these proteins in hop resistance against *V. nonalfalfae*.

### Biography

Branka Javornik is working as Head of Biotechnology Studies in Biotechnical Faculty at University of Ljubljana, Slovenia. Her international experience includes various programs, contributions and participation in different countries for diverse fields of study and interests reflect in wide range of publications in various national and international journals.

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