Molecular responses of Phytophthora capsici-challenged cucumber (Cucumis sativus L.) plants as influenced by resistance inducer application

Phytophthora species are considered as the major cause of several plant diseases resulting in huge yield losses in agricultural crops. Despite years of effort to develop Phytophthora resistance varieties, there is no reports of a resistant cucumber variety. In this study, the effect of concomitant application of potassium phosphite (KPhi) and chitosan on some physiological and molecular responses of Phytophthora capsici-challenged cucumber plants were investigated. Cucumber plants were treated with KPhi and/or Chitosan at different concentrations and were then inoculated with zoospores of P. capsici and leaf samples were collected at different time courses. Results showed that Guaiacol peroxidase (GPOD) enzymatic activity surged immediately at first and second days after pathogen inoculation with a peak in plants treated with 4 gL⁻¹ KPhi 2 days after inoculation. Compared to GPOD, the highest superoxide dismutase (SOD) activity was observed in the same treatment but later at 5 days after inoculation. It was indicated that the activity of antioxidant enzymes was greatly influenced by application of either KPhi or chitosan while their activity was not remarkably enhanced in control plants. qPCR analysis revealed that the highest increase in glutathione peroxidase (gpx) gene expression was achieved in plants concomitantly treated with 4 gL⁻¹ KPhi and 0.2 mgL⁻¹ chitosan 5 days after inoculation. The findings of this study provide novel information regarding inducing mechanisms of KPhi and chitosan which may be effective in mitigating disease severity.

Resistance inducer, Cucumber, potassium phosphite, Chitosan, Defense Response
این صفحه به معنای تاییدیه نمایه سازی مقاله در پایگاه استنادی سیویلیکا می‌باشد. در هر لحظه به منظور تایید اصلاحات این گواهی می‌توانید وضعیت ثبت مقاله را از طریق لینک فوق به صورت آنلاین کنترل نمایید.