

Secretome analysis of the phytopathogen *Macrophomina phaseolina* cultivated in liquid medium supplemented with and without soybean leaf infusion

Amiliana Pineda-Fretez, Adriana Orrego, Julio César Masaru Iehisa, María Eugenia Flores-Giubi, Javier E. Barúa, Rosa Sánchez-Lucas, Jesús Jorrín-Novó, María Cristina Romero-Rodríguez

Abstract

Macrophomina phaseolina (Tassi) Goid. is a fungal pathogen that causes root and stem rot in several economically important crops. However, most of disease control strategies have shown limited effectiveness. Despite its impact on agriculture, molecular mechanisms involved in the interaction with host plant remains poorly understood. Nevertheless, it has been proven that fungal pathogens secrete a variety of proteins and metabolites to successfully infect their host plants. In this study, a proteomic analysis of proteins secreted by *M. phaseolina* in culture media supplemented with soybean leaf infusion was performed. A total of 250 proteins were identified with a predominance of hydrolytic enzymes. Plant cell wall degrading enzymes together peptidases were found, probably involved in the infection process. Predicted effector proteins were also found that could induce plant cell death or suppress plant immune response. Some of the putative effectors presented similarities to known fungal virulence factors. Expression analysis of ten selected protein-coding genes showed that these genes are induced during host tissue infection and suggested their participation in the infection process. The identification of secreted proteins of *M. phaseolina* could be used to improve the understanding of the biology and pathogenesis of this fungus. Although leaf infusion was able to induce changes at the proteome level, it is necessary to study the changes induced under conditions that mimic the natural infection process of the soil-borne pathogen *M. phaseolina* to identify virulence factors.