Abstract

Nowadays, humankind is facing the global climate crisis with new challenges. One of them is a threat of vast crop yield losses caused by growing populations of fungal plant pathogens such as *Fusarium proliferatum*. This hemibiotrophic organism infects various host plants, including asparagus, maize, garlic and pineapple. Moreover, this fungus is able to produce a number of harmful mycotoxins including fumonisin B_1, moniliformin, bauvericin and fusaproliferin. The lack of effective plant protection products widens an issue of *F. proliferatym* management in an environment. Therefore, in order to evaluate the *F. proliferatum* mechanisms triggered during plant-pathogen interaction, three experiments with extracts, fractions and bioactive compounds derived from host plants were conducted. Experiments were carried out *in vitro* in liquid cultures of *F. proliferatum* strains treated with plant stressors. Then, a series of analyses were performed, including dry biomass measurements, selected genes' expression analysis as well as quantification of type B (FB_{1-3}) fumonisins. The results obtained have confirmed the significant effect of tested extracts, fractions and plant bioactive compounds on primary and secondary metabolism of *F. proliferatum*. Stress factors influenced the expression of primary target genes – especially genes encoding heat shock proteins, and also the expression of the *FUM* gene cluster involved in fumonisins biosynthesis. Extracts, fractions and plant bioactive compounds might act as stress factors or signal molecules, depending on their concentrations. Applied stress factors caused a significant reduction of fumonisins content, while low concentration of chlorogenic acid was an exception and led to FB_1 induction. Further research on the defense mechanisms of *F. proliferatum* and its interaction with host plant is needed. There is a chance that extracts, fractions or plant bioactive compounds will be used as plant protection products in the future.