NEW PROMISING "BIOFUNGICIDES" TARGETING THE FUNGAL CELL WALL TO CONTROL THE CUCURBIT POWDERY MILDEW *PODOSPHAERA XANTHII*

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One of the main limitations of cucurbit production is the powdery mildew disease, caused by *Podosphaera xanthii*. Although different management strategies are used to control it, the application of fungicides is the most effective. However, there are two major problems: the rapid emergence of resistance to fungicides by the pathogen and the strong restrictions on the use and diversity of phytosanitary products imposed at the European level. For this reason, novel targets and strategies are needed to develop new "biofungicides" for sustainable disease control. The fungal cell wall (CW) is a unique and essential structure, not present in human or animal cells, which makes it an ideal target for the development of new phytosanitary products. In this study, three *P. xanthii* cell wall-related genes (coding a GPI-anchored membrane protein and two proteins involved in the synthesis of rhamnose) were studied. To understand their impact on the development of *P. xanthii*, RNA interference (RNAi) technology was used. For this purpose, dsRNA molecules were synthesized and several assays were performed. The infiltration and leaf disc assays on melon and zucchini cotyledons, respectively, showed an effective gene silencing effect, resulting in a significant reduction of gene expression, fungal biomass and area covered by powdery mildew disease. Microscopy analysis confirmed the impact on fungal penetration points. In addition, the application of dsRNAs, through spray-induced gene silencing (SIGS) assays, resulted in a significant decrease in disease development on melon plants. According to the results obtained, these genes could serve as potential targets for the development of new generations of antifungal agents. In addition, SIGS technology could be a promising strategy to incorporate into integrated management programs for this important disease.

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