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Conserved and non-annotated proteins of *Podosphaera xanthii*: new target candidates for the control of powdery mildews by spray-induced gene silencing

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One of the most important limiting factors for cucurbit production worldwide is the powdery mildew fungus *Podosphaera xanthii*. Despite the efforts invested in plant breeding programs and chemical companies, effective control of this pathogen remains elusive to growers. In this work, we examined the potential of RNAi technology called spray-induced gene silencing (SIGS) for controlling cucurbit powdery mildew. For that, we first developed a new and simple gene silencing method for *P. xanthii* based on the application of dsRNAs to the plant surface. Moreover, to identify new target candidate genes, we focused on the study of a set of sixty conserved and non-annotated proteins (CNAPs) deduced from the *P. xanthii* transcriptome. After protein modeling and ligand prediction studies, six proteins presumably involved in respiration, glycosylation and efflux transport, were selected. Functional analysis of these CNAP coding genes by dsRNA-induced gene silencing resulted in strong silencing phenotypes with large reductions in fungal growth and disease symptoms. Due to their important contributions to fungal development, three of these *CNAP* genes were selected as targets to conduct SIGS assays under plant growth chamber conditions. The spray application of these dsRNAs induced high levels of disease control, supporting that SIGS could be a promising tool for controlling powdery mildews.

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