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Manuscript Title:

Sugar Transporters in Plasmodiophora brassicae: Genome-Wide Identification and Functional Verification

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Abstract:

Plasmodiophora brassicae, an obligate intracellular pathogen, can hijack the host's carbohydrates for survival. When the host plant is infected by *P. brassicae*, a large amount of soluble sugar accumulates in the roots, especially glucose, which probably facilitates the development of this pathogen. Although a complete glycolytic and TCA cycle existed in *P. brassicae*, very little information about the hexose transport system has been reported. In this study, we screened 17 putative sugar transporters based on information about their typical domains. The structure of these transporters showed a lot of variation compared with that of other organisms, especially the number of transmembrane helices (TMHs). Phylogenetic analysis indicated that these sugar transporters were far from the evolutionary relationship of other organisms and were unique in *P. brassicae*. The hexose transport activity assay indicated that eight transporters transported glucose or fructose and could restore the growth of yeast strain EBY.VW4000, which was deficient in hexose transport. The expression level of these glucose...

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