Roles of hydrophilin-like protein in the filamentous fungi Alternaria brassicicola

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Résumé en anglais	During their life cycle, fungi face adverse environmental conditions associated with alterations in water status. Phytopathogenic fungi are faced with this type of stress during the infection process, especially when they colonize seeds. Although these organisms are particularly effective to adapt to these water potential decreases, these coping mechanisms are so far very poorly described, particularly in filamentous fungi. *Alternaria brassicicola* is a seed-borne fungal pathogen responsible for the black spot disease on *Brassicaceae* plants. Alteration of *Brassicaceae* seed quality is one of the most damaging effects of the black spot. Beyond contribution to pathogen dissemination, the presence of the fungus on the seeds compromises seedling germination and survival. To better understand the determinism of fungus transmission to seeds, we previously established a reliable Arabidopsis-based pathosystem allowing investigations of *A. brassicicola* transmission to seeds. In particular, we showed that two mutants strain Δabhog and Δabnik exhibiting higher susceptibility to osmotic and water stress were highly impaired in seed transmission ability. Transcriptomic analyzes, carried out under different experimental in vitro conditions inducing these types of stress (addition of sorbitol or Poly Ethylene Glycol (PEG) or by incubation under low relative humidity (1% RH)), allowed us to identify additional mechanisms potentially involved in the fungal adaptive responses. In particular, these analyzes revealed a pool of over-expressed genes encoding putative proteins which share physiochemical features typical of hydrophilin-like proteins. We initiated studies of some of these hydrophilins by generating respective Knock-Out mutants. Functional studies has been carried out to determine whether these mutants were impaired in their adaptive response to water stress and other types of stress (such as oxidative stress) and whether hydrophilins are involved in pathogenicity. Additional transcriptomic assays conducted on Δabhog and Δabnik strain growth under sorbitol exposure revealed that numerous hydrophilins are regulated by these two genes.
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