Poster Presentation 2

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The mitogen-activated protein kinase CsPMK1 regulates development and pathogenicity of *Colletotrichum scovillei*

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The phytopathogenic fungus *Colletotrichum scovillei* is a common agent to cause severe anthracnose disease of pepper (*Capsicum annuum*). To establish invasion in host cells, the *C. scovillei* develops specialized structures called appressoria to penetrate plant surface. The appressorium-mediated infection regulated by signaling pathways have been found to play indispensable roles in several plant pathogenic fungi. The conserved mitogen-activated protein (MAP) kinase PMK1 is known to orchestrate appressorium development during infection. To study the PMK1 orthologue in *C. scovillei*, a homologous replacement method was used to delete the gene CAP_011033.1 (named CsPMK1), which was predicted to encode a protein sharing 99% identity with PMK1 from *Magnaporthe oryzae*. Deletion of CsPMK1 resulted in a mutant showing normal mycelial growth and conidiation, and impaired conidial germination on both artificial surfaces and host plant epidermis, compared to wild type. This result indicates that CsPMK1 is related to conidial germination. However, germinated conidia of ΔCspmk1 failed to produce appressoria on the same surfaces, which suggests that CsPMK1 is required for appressorium formation. The plant pathogenic assays displayed that ΔCspmk1 was unable to cause lesion on both wounded and unwounded healthy pepper fruits, which implies that CsPMK1 may be associated with penetration and invasion in host plant. Localization of CsPMK1: GFP fusion protein showed that a strong GFP signal was detectable in developing conidia and appressoria, which is corresponded to the phenotypes of ΔCspmk1. Collectively, these results suggest that CsPMK1 regulates infection-related morphogenesis of *C. scovillei*.