6. CONCLUSION AND FUTURE PROSPECTIVE

We characterised MoHPT1, the only histidine phosphotransferase in *M. oryzae* B157, by using RNAi silencing technology. We analysed the function of MoHPT1 in *M. oryzae* under stress conditions as well as light induced condition. Our results indicated that MoHPT1 is an essential gene in *M. oryzae* B157. Further functional examination showed that MoHPT1 is required for stress adaptation in response to oxidative stress, osmotic stress and cell wall stress. The results suggest that the stress adaptation to oxidative stress through MoHPT1 is brought about by signalling of Hog1, while the stress adaptation to cell wall stress is brought about by MPS1 signalling. These observations open up an avenue to explore the mechanism of MoHPT1 regulation of HOG1 and MPS1 pathway and to explore cross signalling between these two pathways. This study also reveals a novel role for MoHPT1 in response to light. The existence of dual MoHPT1 transcripts (of which the novel transcript is induced in presence of light) and the regulation of the PAS domain containing Histidine kinases influenced by MoHPT1 provide a new area for scientific evaluation as to how and when MoHPT1 light response is obligatory. Whether MoHPT1 has any other functions related to circadian rhythms is yet another question to be followed up. The global transcriptome analysis of MoHPT1 knock-down showed differential expression of genes which are required for *in planta* growth of the fungus. The up-regulated genes were mostly those which are expressed during biotrophic growth and down-regulated genes were mostly those required for necrotrophic growth. This observation suggests that MoHPT1 has some important role in the transition from biotrophic to necrotrophic growth of the pathogen in the host. How this regulation is brought about by MoHPT1 provides scope for
further investigation. On the whole this study has provided several valuable new insights into the functional role of *MoHPT1* in stress adaptation and pathogenicity.