Entry No. IRRC-0223

Category	: International Rice Research Conference
Select Theme	: Genetics of Biotic interactions: Stress tolerance, Mitigation and Microbiome
Endorsement email	:
Genetics of Biotic interactions Stress tolerance Mitigation and MicrobiomeKeyword 1	: Diseases
Genetics of Biotic interactions Stress tolerance Mitigation and Microbiome Keyword 2	: fungi
Genetics of Biotic interactions Stress tolerance Mitigation and MicrobiomeKeyword 3	: smut
Title of Entry	: Mitochondrial dynamics and mitophagy are necessary for proper transition to necrotrophy in Rice Blast
Presenting author	: Yanjun Kou
Presenting author email	: kouyanjun@caas.cn
Co author 1	: Yunglong He
Co author 2	: Yazhou Shu
Co author 3	: Fan Yang
Co author 4	: Naweed I. Naqvi
Co author 5	:
Co author 6	:
Co author 7	:
Co author 8	:
Co author 9	:
Co author 10	:
Co author 11	:
Co author 12	:
Co author 13	:
Co author 14	:

Affiliation presenting author	: Yanjun Kou
Affiliation 1	:
Affiliation 2	:
Affiliation 3	:
Affiliation 4	:
Affiliation 5	:
Affiliation 6	:
Affiliation 7	:
Affiliation 8	:
Affiliation 9	:
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Select only one type of presentation	: 15 minute oral presentation
Abstract	: Magnaporthe oryzae causes Blast disease, which is one of the most devastating infections in rice and other cereal crops. M. oryzae needs to coordinate nutrients sensing, gene regulation, morphological changes, nutrient acquisition, and evade the host defense, in order to invade and proliferate within the host tissues. Thus far, the molecular mechanisms underlying the regulation of invasive growth in planta have largely remained unknown. We identified a precise filamentous-punctate-filamentous cycle in mitochondrial morphology during Magnaporthe-Rice interaction. Subsequently, we found that loss of mitochondrial fusion (Fzo1) or fission (Dnm1) machinery highly reduced the pathogenicity of M. oryzae. Furthermore, exogenous carbon sources but not antioxidant treatment could delay such mitochondrial dynamics during invasive growth, thus suggesting that nutrient availability regulates mitochondrial dynamics therein. In addition, MoAtg24-mediated mitophagy was found to be essential for the biotrophy-to-necrotrophy transition, and proper invasive growth in rice blast. In conclusion, mitochondrial dynamics and mitophagy during biotrophic-necrotrophic phase switch are required for proper induction and establishment of the blast disease in rice. Read Less»

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