

## Abscisic acid and jasmonates: the phytohormones behind the yield losses in sheath rot-affected rice?

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Sheath rot is a fast spreading rice disease that can destroy the total yield of a growing season. Diseased plants show brown necrotic lesions on the uppermost leaf sheath and produce empty seeds or no seeds at all. Sheath rot can be caused by the toxin-producing pathogens, *Sarocladium oryzae* and *Pseudomonas fuscovaginae*. The fungus *S. oryzae* produces helvolic acid and cerulenin and the bacterium *P. fuscovaginae* produces cyclic lipopeptides. These toxins show antimicrobial and phytotoxic activity. Since it is not understood how the pathogens interact with their host, phytohormones were measured in the rice sheath at different time points during the infection process using HPLC-ESI-MS/HRMS. Interestingly, both pathogens triggered abscisic acid (ABA), jasmonic acid (JA) and its precursor 12-oxo-phytodienoic acid (OPDA). Phytohormone levels showed a strong correlation with severity of sheath rot symptoms and grain production. For *S. oryzae*, these levels were also strongly correlated with *in planta* helvolic acid production. Although ABA, JA and OPDA are known for their defense-regulatory role, they do not act as resistance factors in the *S. oryzae*-rice pathosystem. It is known, however, that ABA and JA pathways act together to interfere with seed set and filling by interrupting source-sink relationships which results in lower grain yields. We hypothesise that the strong effects on seed production and filling, seen in sheath rot-affected plants, are due to increased ABA and oxylipin levels. We are currently investigating the role of the microbial toxins in this process by using knock-out mutants in both pathogens.